COLUMBIA LIBRARIES OFFSITE
HEALTH SCIENCES RESTRICTED
HR02214814

Biennial report

SERIAL

Columbia University
in the City of New York

College of Physicians and Surgeons

Library

DEC 22 1943 DLG

Digitized by the Internet Archive
in 2010 with funding from
Open Knowledge Commons

http://www.archive.org/details/biennialreport46nort

FOURTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1891-1892.

RALEIGH, N. C.:
JOSEPHUS DANIELS, STATE PRINTER AND BINDER.
Presses of Edwards & Broughton.
1893.

FOURTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1891-1892.

RALEIGH, N. C.:
JOSEPHUS DANIELS, STATE PRINTER AND BINDER.
Presses of Edwards & Broughton.
1893.

MEMBERS OF THE BOARD.

H. T. Bahnson, M. D., President .... Salem.
Term Expires 1893.

Richard H. Lewis, M. D., Secretary and Treasurer ...... Raleigh.
Term Expires 1893.

J. A. Hodges, M. D. .... Fayetteville.
Term Expires 1895.

W. H. Harrell, M. D. .... Williamston.
Term Expires 1895.

S. Westray Battle, M. D. .... Asheville.
Term Expires 1897.

George Gillett Thomas, M. D. .... Wilmington.
Term Expires 1897.

Appointments by the Governor, Terms Expiring 1893.
J. H. Tucker, M. D. .... Henderson.
F. P. Venable, Ph. D., F. C. S. .... Chapel Hill.
J. L. Ludlow, C. E. .... Winston.

STANDING COMMITTEES.

Epidemics—Drs. Lewis and Hodges.

Water Supply and Drainage—Dr. Bahnson and Mr. Ludlow.

Hygienics of Public Schools—Drs. Hodges and Tucker.

Climatology——Dr. S. W. Battle.

Adulteration of Food and Medicines—Prof. F. P. Venable.

Sanitary Condition of State Institutions—Drs. Thomas and Harrell.

Vital Statistics—Drs. Lewis, Thomas and Bahnson.

LIST OF SUPERINTENDENTS OF HEALTH IN THE STATE OF NORTH CAROLINA, DECEMBER 31, 1892.

Alamance—Dr. G. W. Long, Graham.
Alexander—Dr. J. B. Watts, Taylorsville.
Anson—Dr. E. F. Ashe, Wadesboro.
Beaufort—Dr. S. T. Nicholson, Washington.
Bladen—Dr. Newton Robinson, Elizabethtown.
Buncombe—Dr. C. E. Hilliard, Asheville.
Burke—Dr. J. L. Laxton, Morganton.
Caldwell—Dr. A. A. Kent, Lenoir.
Carteret—Dr. M. F. Arendell, Morehead City.
Caswell—Dr. R. H. Williamson, Yanceyville.
Catawba—Dr. George H. West, Newton.
Chatham—Dr. H. T. Chapin, Pittsboro.
Cherokee—Dr. J. F. Abernathy, Murphy.
Cleveland—Dr. O. P. Gardner, Shelby.
Columbus—Dr. I. Jackson, Whiteville.
Craven—Dr. L. Duffy, Newbern.
Cumberland—Dr. J. H. Marsh, Fayetteville.
Davidson—Dr. R. L. Payne, Jr., Lexington.
Duplin—Dr. J. W. Blount, Kenansville.
Durham—Dr. N. M. Johnson, Durham.
Edgecombe—Dr. Donald Williams, Tarboro.
Forsyth—Dr. D. N. Dalton, Winston.
Franklin—Dr. E. S. Foster, Louisburg.
Gaston—Dr. J. H. Jenkins, Dallas.
Granville—Dr. Patrick Booth, Oxford.
Greene—Dr. E. H. Sugg, Snow Hill.
Guilford—Dr. E. R. Michaux, Greensboro.
Haywood—Dr. J. Howell Way, Waynesville.
Henderson—Dr. J. L. Egerton, Hendersonville.
Iredell—Dr. W. J. Hill, Statesville.
Johnston—Dr. R. J. Noble, Smithfield.
Lenoir—Dr. C. B. Woodley, Kinston.
Lincoln—Dr. W. L. Crouse, Lincolnton.
Macon—Dr. S. H. Lyle, Franklin.
Martin—Dr. W. H. Harrell, Williamston.
McDowell—Dr. B. A. Cheek, Marion.
Mitchell—Dr. C. E. Smith, Bakersville.
Montgomery—Dr. F. E. Asbury, Asbury.
Moore—Dr. Gilbert McLeod, Carthage.
Nash—Dr. J. J. Mann, Nashville.
New Hanover—Dr. F. W. Potter, Wilmington.

233618

NORTHAMPTON—Dr. H. W. Lewis, Jackson.
ONSLOW—Dr. E. L. Cox, Jacksonville.
ORANGE—Dr. D. C. Parris, Hillsboro.
PENDER—
PITT—Dr. B. T. Cox, Redallia.
RANDOLPH—Dr. J. M. Boyette, Ashboro.
RICHMOND—Dr. J. M. Stansill, Rockingham.
ROBESON—Dr. R. F. Lewis, Lumberton.
ROWAN—Dr. J. J. Summerell, Salisbury.
RUTHERFORD—Dr. W. A. Thompson, Cliffdale.
SAMPSON—Dr. John A. Stevens, Clinton.
STANLY—Dr. A. C. Bayles, New London.
STOKES—Dr. J. W. Neal, Meadows.
SWAIN—Dr. R. L. Davis, Bryson City.
TYRRELL—Dr. Ab. Alexander, Columbia.
UNION—Dr. W. C. Ramsay, Monroe.
VANCE—Dr. A. Cheatham, Henderson.
WAKE—Dr. James McKee, Raleigh.
WARREN—Dr. P. J. Macon, Warrenton.
WATAUGA—Dr. W. B. Council, Boone.
WAYNE—Dr. John Spicer, Goldsboro.
WILSON—Dr. Albert Anderson, Wilson.
YADKIN—Dr. T. R. Harding, Yadkinville.
YANCEY—Dr. J. L. Ray, Burnsville.

North Carolina Board of Health,
Secretary's Office,
Raleigh, N. C., January 3, 1893.

His Excellency Thomas M. Holt,
Governor of North Carolina:

Sir—In accordance with section 2 of the "Act Relating to the Board of Health," I have the honor to present this the Fourth Biennial Report of the North Carolina Board of Health under the amended law, ratified by the General Assembly on the 9th March, 1885.

RICHARD H. LEWIS, M. D.,
Secretary and Treasurer.

FOURTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH.

1891-1892.

Since its last report the Board of Health, and the cause of preventive medicine in North Carolina, in general, has suffered an irreparable loss in the death, on August 22 last, in the prime of life, of its late Secretary and Treasurer, Thomas Fanning Wood, M. D., LL. D., of Wilmington.

He was the great apostle of sanitation in our State and was the father of the North Carolina Board of Health, not alone in the sense of originating it, but also in that of the wise and tender parent who nourished and sustained it during its years of feeble and struggling infancy. Not content with giving his valuable time, without stint, he contributed liberally of his not over-abundant private means in order to sustain it with a show of respectability until, in 1885, the General Assembly of the State manifested its appreciation of the work he had accomplished by putting it on a living basis. Indeed, it may be said that he gave his life for this cause, for it was in making a tour of inspection of the convict camps in the western part of the State, while climbing a steep mountain side, with a heavy valise—an accident on the railroad rendering it necessary—that he felt the first intimation of the disease (aneurism of the aorta) which caused his death.

While he was an able and learned physician, and possessed of varied scientific and literary accomplishments, the secret of the power for good which he exerted in so many ways in his day and generation is not to be found in either his talents or his large accumulation of knowledge. But it was because of the loftiness of his ideals, the purity of his motives, the sincerity of his convictions, and his unselfish and untiring devotion to the good of his fellow-men that his life was an inspiration to his associates, and he was enabled to excite an interest and accomplish results that mere intellectual endowment could never have compassed. The community in which he lived, irrespective of creed or condition, and the profession he elevated and adorned alike, rise up and call him blessed.

We have also been called upon still more recently to mourn the departure of Dr. S. S. Satchwell, of Burgaw. For a great many years he was a prominent member of the Medical Society of North Carolina, and one of the largest contributors to its transactions. He was the first President of the State Board of Health and, later, Superintendent of Health for Pender County. In both positions he showed an active and intelligent interest in sanitary matters, and was always ready with tongue and pen to serve the cause.

MEETINGS OF THE BOARD.

PROCEEDINGS OF THE CONJOINT SESSION WITH THE STATE MEDICAL SOCIETY AT ASHEVILLE, MAY 27, 1891.

The President announced that the hour had arrived for the conjoint session with the Board of Health.

The President of the Board of Health, Dr. H. T. Bahnson, took the chair and stated that after quiet was resumed the conjoint session would come to order.

He said it was his duty to announce the lamentable fact that the Board of Health of North Carolina is still occupying the anomalous position which it occupied at its incipiency—a regularly organized Board without executive authority, appointed by the Legislature as an advisory Board on all matters pertaining to hygiene and the preservation of health. The services of such a Board are infrequently, one may say almost never, called upon, and we therefore have very little, if any, progress to report. To the few faithful who remain to hear the discussions and deliberations of this Board, I would like to make one or two suggestions: In the first place, the anomalous position of our Board as a simply advisory Board, without executive functions, has exposed us, and with us the medical profession of North Carolina, to what might properly be called a slight by the action of the last Legislature in determining the character of books on medical and hygienic subjects which should be used in our public schools, and I hope the matter will have a limited discussion, at any rate. I refer to the adoption, under the influence of the so-called "Woman's Christian Temperance Union," of a book on the influence of alcohol on the human system. The teaching of this book must be forced upon the youngest children. He regretted the ignorance of the State Legislature in entrusting the mental hygiene of our children to the secretary of a body like that. It should have been referred to the State Board of Health, certainly, to the conjoint action of that Board and this Society.

Another thing he wished to speak of was the want of interest which pervades the state on the important subject of health preservation and hygiene. It has been suggested to inaugurate a system of "missionary" sanitary conventions to be held in different parts of the State. Unfortunately, a movement of this sort must be entirely a labor of love, owing to the smallness of the fund at the command of the Board.

The third and last point to which your attention is asked is to the fact that two members are to be elected to the State Board at this meeting. The terms of office of Drs. Wood and Hilliard expire at this time and their successors are to be elected.

The Secretary of the Board, Dr. Thomas F. Wood, said he would not detain the meeting with a full report, as the third biennial report was just to hand from the publishing office, and these would be distributed to the members present. He would, however, call their attention particularly to two or three points in the report. It will be observed that the Board has centered its efforts more largely on the matter of vital statistics. Whether or not North Carolinians think it is of importance to know how this teeming population come and go, gets sick and gets well or dies, it is an important matter, and they must understand that the eyes of the statistical world are upon us, and these things are sought after. It is not necessary to speak of this to the people of Asheville, for they already understand it. Intending immigrants want to know all these things concerning the weather and the death-rate. We have gathered and tabulated these facts, and they are based, in most instances, on the reports received from the superintendents of health. These reports are based on the death certificates of physicians, and all present will therefore see the importance of reporting all these facts to the Superintendent of Health.

He referred especially to the condition of the poor-houses and jails in the State. It is an open secret that many of these were a disgrace to the State. There were men incarcerated merely on suspicion and dying from cold and exposure. We have carefully, year by year, given these conditions publicity through the *Bulletin* of the Board. Notice the results in the tables presented in the report—the establishment of new jails and poor-houses, of hospitals in connection with the poor-houses in several instances, and the general improvement in the sanitary condition of these institutions. We consider this a favorable augury that the people of North Carolina are beginning to understand that public health is public wealth. You are not all aware of the fact that the delay in the reports of diseases dangerous to public health, such as small-pox, cholera, etc , is doing a good deal of harm in some localities. It only happens occasionally that we have cases of small-pox in this State. As soon as a case of such a disease is known to a physician, he should report at once to the Superintendent of Health of his county, and if there is no Superintendent, the report should be made to the Secretary of the State Board. As soon as we know of a case of small-pox or other contagious disease, we can place at the disposal of the Superintendent of Health means for the prevention of its spread, and if the Superintendent is not certain of his diagnosis, let him call a consultation, and the State Board will bear the expense; or, if deemed necessary, a committee from the State Board will visit the spot and give its assistance to the Superintendent. He hoped every Superintendent in the State would read this report carefully and take notice of how far he had failed in doing his duty. Special attention was called to the table showing the prevailing diseases for the two years. In this report, taking a single county, the different seasons of the year could be compared as to the influence of each on health, or, taking any given season, the different counties could be compared. Such a table as this, if it could be made as accurate as mortuary statistics can be, would be of the greatest interest and importance, not only to the people in the State, but to those who are thinking of coming among us.

ELECTION OF TWO NEW MEMBERS.

The election of members to fill vacancies being the next order of business, Dr. Weaver nominated Dr. Thomas F. Wood. The motion was made that Dr. Wood be elected by acclamation, but the law requiring the election to be by ballot, it was moved and carried that Dr. Faison cast the vote of the meeting for Dr. Wood. It was done, and Dr. Wood was declared duly elected to be his own successor.

Dr. J. W. Long put in nomination Dr. S. Westray Battle, and Dr. McNeill nominated Dr. H. B. Weaver.

There were 54 votes cast, necessary to a choice 28. Of these Dr. Battle received 31, Dr. Weaver 22 and Dr. Hilliard 1. Dr. Battle was declared elected.

On hearing his name put in nomination Dr. Battle asked to have it withdrawn on account of pressure of personal business. However, on being elected he thanked the Society for the honor, and said that he accepted it.

NORTH CAROLINA SANITARY ASSOCIATION.

Dr. Wood announced that it was the wish of the State Board to have a meeting of the Sanitary Association that was formed at Raleigh two years since. They wanted the meeting in conjunction with the Board of Health, and he wanted it spread abroad that it was not a meeting of doctors only, but that people in all trades and professions take part in these meetings and are especially asked to come. The matters to be talked of are not medical, and the ears of those out of the profession who are present will not be hurt by jarring, incomprehensible medical terms. The proposition has not been definitely settled, but the day will probably be fixed for August.

Dr. Hays invited the Sanitary Association to consider Oxford in selecting a place for the meeting, and Dr. Summerell spoke in favor of Salisbury.

Dr. Wood said in that the meeting was to be on the missionary order, it should be held where there seemed to be the most ignorance in regard to sanitary science. He said that much good had resulted from these meetings of sanitary bodies, *e g.*, the city of Memphis had been helped to be one of the most salubrious cities in the South by the meeting within its borders of the American Public Health Association, this Association being invited thereto by the extremely unsanitary condition of the city, and its very high death-rate.

Dr. Hodges, in reference to the action of the Legislature in adopting certain books to be used in the public schools, said it had been the source of much controversy in the State, and asked if it were the intention of the Conjoint Session to take any action on the matter.

The President said he had brought the subject up only to show how the State Board of Health and the profession had been ignored in the matter, and to give it as his opinion that the Board of Health and the physicians are fitted, and should be asked to give their judgment on such matters.

Dr. Hodges said that, although some one had said that Dr. Wood was in reality the Board of Health, and while he recognizes Dr. Wood's untiring zeal in the work of the Board, *he must have the coöperation of you all.* If the influence of the Board was made to be felt by the masses through the physicians it could accomplish more good. He hoped the Superintendents of Health would remember the words of Dr. Wood and aid the Board with more energy and interest than has been the case. The Board accomplishes a work many of you do not know of; and if you will take this Annual Report home with you and study it, and will then enlighten the people, you will do much to help the Board. And when we have the meeting of the Sanitary Association get your Mayor to come to that meeting, and come yourselves, and it will be made an important thing for the State. He referred to the success of the Raleigh meeting. He was not a member of the State Board at the time of that meeting, but he was a Superintendent of Health, and attended the meeting only to show his interest in the matter of State sanitation; but when he had been in attendance a very short time he became deeply interested in the proceedings. He said that the resolution sent up by Dr. Satchwell on yesterday and acted upon by the Medical Society would have been postponed and brought before this meeting if the Board were recognized as it should be. It was a matter for the Board of Health especially, and not for the Medical Society. There have been many good papers read in these meetings, but they have not been appreciated because they came from a body which even you physicians seem to ignore.

Dr. Harrell asked if a majority of all the members of Boards of Health were necessary for the election of a Superintendent.

Dr. Wood gave it as his opinion that it required only a majority of those present at the meeting at which the election took place, and that members could not vote by proxy.

In reply to a question from Dr. Harrell, if there was any way to reduce the number of mill-ponds in the country, Dr. Wood said he knew of no way except the statutory method of having the ponds condemned as public nuisances.

DETAILS OF THE ORGANIZATION OF COUNTY BOARDS.

In answer to the question as to who has the authority to call a meeting of the County Board of Health, how often these meetings should be held, and when the meeting for the election of a Superintendent of Health should be held, Dr. Wood made the following explanation: If there is no county board in existence, the Chairman of the County Commissioners has to issue a call for a meeting of all those who are eligible to membership on the board. This call may be made voluntarily on the part of the Chairman of the County Commissioners or at the suggestion of some one who is eligible to membership. After the meeting of organization he supposed that each board could make its own rules as to who could call a meeting of the board. In New Hanover County it has been the custom for the Superintendent to call special meetings, as being the one who more than any other comes in contact with those circumstances which call for the action of the board as a whole. He may either act voluntarily or on the request of one or more members of the board. Where there is no board organized, a meeting for organization may be held at any time and a Superintendent elected at any time, but his successor must be elected at a meeting held on the first Monday in the next succeeding September, and an election held every two years thereafter. If the time appointed by law for the election of the successor of an incumbent should pass without a meeting having been held, he would consider it equivalent to the reëlection of that incumbent; provided a notice of the meeting had been advertised. Otherwise, the office should be considered vacant and a meeting called to elect a Superintendent to fill the unexpired term. The law requires that the meeting for the election of a Superintendent *shall* be held on the first Monday in September, the person elected to hold office two years. Special meetings of the board may be held as often as each local board shall desire.

The Conjoint Session adjourned.

CONJOINT SESSION OF THE STATE BOARD OF HEALTH WITH THE STATE MEDICAL SOCIETY AT WILMINGTON, MAY 18, 1892.

The hour having arrived for the Conjoint Session of the Society with the State Board of Health, Dr. H. T. Bahnson, President of the State Board of Health, assumed the chair and called the Conjoint Session to order.

RESIGNATION OF DR. J. M. BAKER.

The Secretary read the resignation of Dr. J. M. Baker, which on motion, was accepted.

A PARTIAL SYNOPSIS OF THE REPORT OF THE SECRETARY OF THE STATE BOARD OF HEALTH.

INFLUENZA.

Since the last report of the Secretary the State has been visited by another epidemic of influenza. It would be more correct to say that all during the year there were cases reported from some of the counties. For instance, in June, from Macon, Mitchell, New Hanover and Pender; July, Greene, Macon and Orange; disappearing in August, appearing again in September in Mitchell and Orange, the next month in Orange and Davidson. In November it set in again in earnest, being reported from 11 counties; in December it had reached 36 counties, mounting to 41 in January, declining again to 36 counties in February.

There are no statistics to determine the death-rate or the number of persons sick with influenza during the periods named. The reports from our towns do not specify influenza as a cause, as in the scheme so far adopted it seemed only practicable to name such diseases as gave indication of the general state of the public health. Without being able to appeal to statistics to demonstrate the loss to the State by death and disability, we know it has been great in hastening the death of old persons and impairing the health of those of middle age.

After having had three years experience with the disease, and the voluminous statistics of all nations—for none have escaped—the practical question to sanitarians is, *How can its spread be averted?* That it is an infectious disease, has been clearly proven by the experience of the best observers, and in England this belief has been so firmly held that a person in a small town was fined for coming on the streets before he was entirely well of the influenza. It must be admitted that, as much information as we have accumulated upon the subject, there seems to be no practicable means of preventing or arresting it. The epidemics in towns have been traced to the arrival of one person from an infected town, but its spread is so rapid and mysterious, and the sickness may be of such an unnoteworthy nature as not to require the attention of a physician, or not to be distinguished from usual non-epidemic catarrh.

As malaria formerly entered into nearly all of our diseases on the seacoast and in the alluvial valleys of the interior, all likely to partake of the malarial type, even surgical cases of a serious nature being almost uniformly dominated by this malarial poison, influenza seems to have asserted the same predominance, either communicating its type to all sickness, or attacking the patient at the most vulnerable point, lighting up rheumatism and gout, precipitating the consumptive in his downward course. While it has had no such destructive influence as the shorter ravages of cholera and small-pox, it has caused losses to towns, and especially to insurance companies and societies, in excess of that of any sickness which has visited the world.*

The domesticated animals have suffered but little from the epidemic in our State, even estimating that the uncertain word "distemper," as used by most reporters, may or may not mean influenza, few counties have reported its presence.

CONSUMPTION.

This disease still continues to be the most important one that afflicts the human race, because of its fatality and universality. In North Carolina we have nothing like the prevalence of the disease that is found in the States north, east and west of us, which may be accounted for in one way by the sparseness of our population and the mildness of our climate. We are speaking, though, as if we had valuable statistics to prove our death-rate, whereas we have only the records of from thirteen to fifteen towns with a population of from 80,000 to 100,000 to estimate upon.

The increased ratio of the death-rate among the negroes is still a striking feature. The causes of this disproportion lie deep in the social conditions of the negro, and the remedy is so far in the future as to seem now all but hopeless If contagion be admitted as a potent cause, none are more subjected to it than the negroes huddled in the suburbs of every Southern town in unwholesome shanties. If syphilis, hereditary and acquired, can lay the foundation for it, the cause is abounding.

---

*This immense loss of money is less burdensome now than it appeared years ago, because it is now borne by insurance companies, and in the days of the plague, small-pox, by individuals, these great epidemics occurring before capital and brotherhood associations had ventured for profit and for philanthropy to provide for the widow and orphan.

But the tuberculosis of negroes is more largely abdominal than with the whites, so much so that *tabes mesenterica* was designated negro consumption par excellence by Dr. Cartwright.

The negro has not become so important a social factor as to have become as interesting pathologically as he may be some day, and so all his diseases are not touched upon in the text-books. Even from Baltimore, which is nearly a Southern town, we have a new Practice of Medicine, and the word negro is not so much as mentioned in the index.

In the absence of more elaborate statistics, we are aware that death is playing havoc with the freedmen, and that the massing of them in the towns is a potent cause of all their constitutional diseases. In the month of March an insurance solicitor informed the Secretary that his company had paid in Wilmington a policy for every day in one week, and the report of Dr. Potter, Superintendent of Health of New Hanover County, shows that for March, 1892, deaths from consumption were four. There is no remedy applicable to this state of things like the return of the negroes to the farms, even if this be applicable. For the moment you discuss the question, the ways and means rise as insuperable obstacles. There has been a removal of negroes from the eastern portion of the State, but the agents who solicited them as laborers for other States found that the town negro was too well satisfied with his easy life there to be beguiled into the turpentine forests of Georgia, the sugar plantations of Louisiana, or the cotton fields of Mississippi. The means are not obvious whereby the consummation of the segregation of these great masses among the farming districts may be accomplished, but it will come in time, or the race is doomed to a large decline by disease, chief of which is consumption.

VITAL STATISTICS OF THE NEGRO.

In "THE ARENA" for April, 1892, we have a thoughtful study of the vital statistics among the negroes. The writer was greatly embarrassed in his investigation of the question by the lack of statistics from the States. Since the days of the faithful statistician, DeBow, Superintendent of the seventh census, no census has been so reliable, especially as to the negro, and the records of few Southern cities were kept regularly and systematically.

The wild conjectures about the immense increase of the negro population made by several contributors to statistical and political papers was contrary to our knowledge of the actual condition of the race. Mr. Frederick L. Hoffman, the author of the article in "THE ARENA" abovementioned, tabulates the white and colored populations of ten Southern States for 1890 from the census, showing the percentage of increase among both races in these States. In the State of North Carolina, for instance, the increase among the whites for the past decade was 20.98 per cent., while for the negroes it was 6.76 per cent., two-thirds less. In Mississippi and Arkansas alone was the increase of the negroes greater than among the whites, while the total average reads, increase among the whites for the ten States 25.07 per cent., and for the negroes 18.29 per cent. Statistics are not at hand to inform us whether the exportation of negroes from the north tier of Southern States to Mississippi and Arkansas went to swell the ratio of increase.

But consumption among all the classes of people in North Carolina is a leading question, and one that we ought to meet with the aid of the large mass of facts which are being collected, with some increased degree of hope. The State sets apart hospitals for the care of the insane, not with positive despair about their future, but with a feeling that a peaceful death is the best solution of their sad estate. Is it not worth the while for the State to show her interest in this great class of curable consumptives and open free sanitaria for an experiment on a large scale at the public expense, and so restore men now hopeless to their places as citizens. Private sanitaria in our State are attracting the attention of the people of the Northern and Western States, and are doing good work. Is not the experiment far enough advanced to encourage the State or philanthropists to undertake free sanitaria for these afflicted citizens?

A question has arisen as to the colonization of consumptives, if it is not unadvisable for the salubrious States fitted for the location of sanitaria to object on the ground of the implantation of the scourge by the massing of the consumptive in heretofore exempt localities. We believe this objection would not hold where such precautions and sanitary rules are adhered to as in the sanitaria. It is well known, though, that when a locality gets a reputation for its salubrity for consumptives, hotels and private houses are thronged by these unfortunate invalids, where hygienic discipline is impossible.

The prophylaxis of consumption is already a practical question, and is assuming a rational stage of practice, through the sanitary associations in the United States.

The American Public Health Association at the Charleston meeting in 1890 had its practical prophylaxis up for discussion, and the remarks of those who took part in the debate showed how seriously some of the leading sanitarians in the country were studying the question.

The Conference of State Boards of Health, which took place in Washington in May, 1891, reported through their committee some resolutions bearing upon the practice of prophylaxis, as follows:

GENTLEMEN—Your committee begs leave to report the following resolutions:

1. That it is the opinion of this Conference that tuberculosis is a zymotic disease; that its germs are developed within the blood and tissues of man and various animals, and that these germs are capable of an existence external to the body for a number of months, especially in dried sputum, and in places where least exposed to the free action of the atmosphere and sunlight.

2. That the germs of tuberculosis are conveyed in various ways to persons and animals, the principal media of these being:

(*a*) Dust containing dried sputum.

(*b*) Food, either contaminated with infected particles, or the flesh of tuberculous animals.

(*c*) Milk from phthisical mothers and tuberculous cows.

3. That unsanitary conditions are the prime factors tending to the development and dissemination of the disease, such as:

(*a*) House and soil dampness.

(*b*) Lack of sunlight and bad ventilation.

(*c*) Bad plumbing and house-drainage.

(*d*) Over-crowding in living-rooms, in schools, in workshops, in public institutions, etc.

4. That the disease is undoubtedly disseminated through the neglect to destroy or disinfect the sputa of the phthisical, distributed as this infectious matter is.

(*a*) On infected linen (dangerous to washer-women), clothing, carpets, etc.

(*b*) On the floors and walls of houses, workshops, hospitals and hotels, especially of health resorts

5. That to limit the spread of tuberculosis it is necessary that notification by physicians and householders of its existence be made compulsory, thereby enabling health authorities to examine into the sanitary surroundings of those affected, and to make provision for the adoption of the necessary precautions against infection to the healthy.

6. That municipal inspection of dressed meat and of dairy cattle be systematically carried out, and that the notification of the health authorities by owners of infected animals be made compulsory.

7. That municipal and State governments ought to aid in the work of limiting the disease by the establishment of institutions especially designed for the reception and treatment of the phthisical, and so situated that while minimizing the danger to the general community, they may likewise supply means for outdoor work and exercise, suited to the condition of different patients.

PETER H. BRYCE, M. D., *Chairman.*
LUCIEN F. SALOMON, M. D.,
PROF. V. C. VAUGHAN."

They are aiding in the progress of prophylactic practice when we as physicians disseminate such information among their patients and insist on its rigid rules when they are attending consumptives. It will be a long time before we can realize the ideal practice set forth by the resolutions of the "Conference," but we can patiently do our share of it and await the education of the people.

RELATION OF TUBERCULOSIS TO ANIMALS.

It is too large a subject to undertake in this report to point out the possibility of the transmission of the disease through the milk and flesh of bovine animals.

We have a remarkable demonstration of the existence of tuberculosis in a fine herd of cattle, reported in the *Medical News* of Philadelphia, and reproduced in the *North Carolina Medical Journal*, for April, 1892.

It must not be presumed that because this find was made in Philadelphia by specialists that it is rare, the serious question is how far spread the disease may be in the cattle in our State. Since we pay no attention to the rudiments of flesh-food inspection, there is little promise that the detection of the disease will be sought after to the apparent detriment of the owners of valuable property. Fortunately, as to the dangers from beef as food, the purification by fire in cooking is our present safeguard. In fact, it is not at all proven that cases can be traced from the consumption of beef. Notwithstanding this, it is no longer a subject we may neglect with impunity.

THE HISTORY OF SMALL-POX IN NORTH CAROLINA—THE INTRODUCTION OF INOCULATION AND VACCINATION; THE CONDITION OF THE INMATES OF OUR JAILS AND POOR-HOUSES AS TO PROTECTION BY VACCINATION.

The small-pox was brought to America by the earlier settlers. It ravaged the Indian tribes fearfully. Lawson* speaks of the Sewee Indians thus: "The small-pox has destroyed many thousands of these natives who, no sooner than they are attacked with the violent fevers and burning which attends that distemper, fling themselves overhead in the water, in the very extremity of the disease, which, shutting up the pores, hinders a kindly evacuation of the pestilential matter and drives it back, by which means death most commonly ensues."

Dr. John Brickell, in his Natural History of North Carolina,† says that the small-pox never visited North Carolina but once, and that in the late Indian war, which destroyed most of those savages that were seized with it.

The small-pox spread in Salem, having been brought there by a company of cavalry of the Pulaski Legion, which in 1779 camped there several days. Forty persons suffered from the disease, of whom only two died. Two years after that (in 1781) inoculation was introduced in Salem.‡ So meagre are statistics relating to the diseases and causes of death of all that period from the time of the first settlements to the time of the organization of the North Carolina Board of Health that nothing is accurately known except the items one can gather from old letters and newspapers, or diaries such as that of Thacher's itinerary American Army in the war of 1777. One exception can be made to the diary so carefully preserved by the Moravian Church in their Archives. Although the note given to current events is short, the historian who is favored with an examination of these valuable documents will find a daily account of births, marriages, deaths and baptisms of the members of that honored fraternity which has shed its benignant influences on the rest of the State for more than a century. It was also in Salem that the first vaccinations are recorded. In 1802 eighty persons were vaccinated there. It is likely that in Wilmington, Fayetteville, NewBerne, Edenton and some of the older towns lying along the great water courses in the line of travel also had adopted vaccination, but no record has come to the eye of the writer.

---

*Dublin, 1737, p. 253.

†History of North Carolina, Raleigh edition, 1860, p, 25.

‡Reichel's Moravians in North Carolina; 12m.: Salem, 1857.

We know nothing of the spread of the practice through the influence of these Christian pioneers, but if they were as diligent in the dissemination of the new prophylactic as they were in carrying the Gospel of Peace to the remotest wilds of civilization, we may be sure that they shared this beneficence with their neighbors.

Down to the period of the civil war cases of small-pox occurred at long intervals, and principally at the seaports. Indeed, so far apart did cases occur that at Wilmington, for instance, when a case was discovered it became necessary to rid the pest-house at Mt. Tirza of the fishermen who had taken possession, to admit the solitary case of small-pox in the person of a sailor. But with the war came an outbreak of small-pox, which increased as the four years rolled on reaching its culmination in 1865-'66 among the great masses of freedmen who flocked to the towns when peace was established.

We all know the story of the scarcity and impurity of vaccine virus during the war period, or if any have forgotten let them read the account of it as written by Dr. Joseph Jones (Spurious Vaccination in the Confederate Armies), and by Dr. James Bolton, of Richmond. Vaccinations which were inoculations of pus, and probably of syphilitic virus, were done from arm to arm by soldiers, and this communicated to people in civil life, causing the direst calamities before the practice could be stopped: After the war was over, and it became necessary to resort to wholesale vaccination, the virus furnished by United States Army officials was of the most unreliable character, defeating the most intelligent attempts at protecting the helpless throngs that crowded into the sea-coast towns.

The history of the small-pox from 1861 to 1866 in Wilmington alone would furnish a complete demonstration of the dangers of neglected vaccination, and the harm of spurious vaccination by crusts taken indiscriminately from doubtful vaccinifers. In the small-pox hospital here there were about 800 patients from August, 1865, to May, 1866—most of them negroes, and most of them unprotected by ante-bellum vaccinations.

There are many physicians in North Carolina who have been practicing twenty-five years who have never seen a case of small-pox, but it will probably not be as many years before they will see cases, if the practice of vaccination just now is to comply with the requirements of insurance companies, most of which will not accept an applicant who is not protected by vaccination, or refuse by written declaration to pay a claim, if the death is from small-pox.

STATISTICS OF JAILS AND POOR-HOUSES.

I have taken the reports of the Superintendents from the *Bulletin* for one month, chosen without particular selection from 1891, and the following are the results. The statistics are from 36 counties :

In three counties all were vaccinated.
In one county 15 out of 20 were vaccinated.
In one county 6 out of 12 were vaccinated.
In twenty-five counties there were no vaccinations.

In the 36 counties the total of inmates of the poor-houses and jails was 864, of whom 104 were vaccinated. That is to say that less than *one* in *eight* were protected by the only known prophylactic. It may not be, and probably is not, a fair deduction to conclude that the entire population is unprotected in the same ratio, but it demonstrates that lack of protection exists among the classes of our population, the criminal and dependent, where, we know, are usually located foci of infection. There are two chief influences that have brought about this state of things :

1st. There is a considerable anti-vaccination sentiment among the people at large. A prejudice which has grown out of the echoes of the English anti-vaccination societies, which are found in the newspapers, and from the lack of conviction on the part of physicians about the necessity of vaccinating infants.

2d. The feeling of security which has overtaken doctors and their patients by the long disappearance of the scourge, and the knowledge of the fact that they can procure in a short time fresh and reliable vaccine.

The State Board of Health sounds the warning now, and this seems to be the appropriate time, when so many representative physicians are present, to call to their attention the fact that their patrons, who ever look to them for protection, are growing up ignorant of the risks they are running without vaccination.

THOMAS F. WOOD, M. D.,
Secretary of the State Board of Health.

DISCUSSION.

Dr. Haigh was much interested in the report of the Secretary. He wished to call attention to the fact that consumption had become implanted in those places that are much frequented as a resort for consumptives, whereas in former years they had been free from the disease. About fourteen years ago he was in Asheville and a friend was boasting of the fact that there had never been a case of consumption in a native and recommended the place as a resort. He made the remark that they would not always enjoy that immunity. He remembered when Italy was a famous resort for consumptives, but that latterly it was becoming deserted by these patients because consumption had gotten such a deep root there. Not long since his friend in Asheville wrote him that he had seen his first case of tuberculosis in one of their inhabitants.

Dr. Westray Battle said in reply that he took up his residence in Asheville about seven years ago, and that at that time there was a prevailing idea that the section embracing an area of about one hundred miles by fifty enjoyed a complete immunity from consumption. Whether that were so he was not prepared to say because no statistics were kept. It was said that a consumptive patient carried to that country would not transmit the disease. He has seen cases that were contracted there; but he thinks his confrères would bear him out in the assertion that the section does enjoy quite a freedom from the disease among the natives.

In the matter of the failure on the part of physicians to vaccinate, Dr. Haigh asked how were we to overcome the difficulty? A physician does not like to order a lot of vaccine virus to keep on hand in case a person desires vaccination, for the virus deteriorates by keeping, and when the case presents itself you would probably not have any virus that is good; nor would he feel exactly at his ease to advertise that he had just received a fresh lot of vaccine and was prepared to vaccinate all who desired the protection. Then, as we are to receive a fee for the service, he cannot make up his mind to go around telling his patients that they ought to be vaccinated; it looks too much like he were using it as a means of increasing his income. He saw only one way out of the difficulty, and that is to take the matter out of the hands of the general practitioner and make it the duty of the superintendents of health, and make it compulsory.

Dr. Potter, Superintendent of Health for New Hanover County, has been in the habit of getting a large quantity of vaccine virus at intervals through the Secretary of the State Board of Health. He takes his stock of virus and goes to the schools and explains the importance of the measure, and then vaccinates all who are willing. In one school of two hundred he vaccinated one hundred and fifty, and all the others had been vaccinated previously. He had very little trouble when once they understood the necessity of it. He makes it a point each spring to go around and vaccinate all he can.

Dr. Wood explained to the members how they could at any time procure a fresh and reliable amount of vaccine virus to meet any emergency that might arise.

Dr. H. W. Lewis gave his experience in the matter of attempting to vaccinate the children of the schools He put up a notice that he would visit the school at a certain date to vaccinate all who desired it, and when he reached the school he found that the pupils had all taken to the woods. He went to another school and found they had no scholars. He thought the Superintendent of Health was placed in a very embarrassing position. He holds the office of Superintendent in his county. He complained that the salary of the Superintendent was left to the Board of Commissioners, and that the service was worth three or four times what they would allow. He thought the salary ought to be fixed by the Legislature in proportion to the number of inmates in the poor-house and the population of the county. The remuneration is so small that it is seldom a competent man can be found willing to accept the office. Let there be evidence of successful vaccination before a pupil may be admitted to the public schools. He thought, as Dr. Wood said, that we are raising a rich harvest ready for the reaper. He suggested that the State Board of Health prepare a pamphlet for distribution among the people, teaching them the vital importance of vaccination.

Dr. D. C. Parris said that in his county (Orange) where he is the Superintendent of Health, vaccination is going by default. There is practically no vaccination except a case now and then in an applicant for life insurance. He thinks nothing but a compulsory law would bring about the desired end.

Dr. Cheatham had listened with much interest to the subject. Our population is of such a character and our railroads of such extent, affording quick and ready communication with other parts of the country, that we are liable at any time to the introduction of small-pox. Numbers of people are constantly making visits to the Northern cities where cases of the disease are frequently occurring and where they are liable to come into contact with it These people are liable to bring it into our midst. He thinks the Society should take some steps toward having a law enacted on the subject.

The President thought nothing but a disastrous epidemic would awaken the people from their lethargy.

Dr. Parris offered a resolution which was amended by Dr. Roberts to read as follows:

Resolved, That the Board of Health be instructed to memorialize the Legislature of the State of North Carolina in regard to a law of compulsory vaccination.

Dr. Graham thought that the Legislature was apt to look upon anything presented by the medical profession with suspicion, and thought it would be best to approach them through the Superintendent of Public Instruction.

Dr. Hodges thought a mere appeal would amount to nothing, but that a committee should be appointed to be present when the bill is presented to work it up by direct conversation with the individual members.

Dr. Roberts explained that he had put the resolution in such form that just what to do and how to do it should be left to the discretion of the Board of Health.

Dr. Lewis amended the resolution as follows:

That a committee be selected by the Board of Health to go to Raleigh and get through the best law possible on vaccination.

The amendment was adopted.

ELECTION OF A NEW MEMBER.

The election of a new member on the Board of Health to fill the unexpired term of Dr. Baker was declared in order.

Dr. H. W. Lewis, of Jackson, and Dr. W. H. Harrell, of Williamston, were put in nomination. The result of the ballot was in favor of Dr. Harrell, and on motion of Dr. Lewis, the election was made unanimous.

The conjoint session was declared adjourned.

ON BOARD STEAMER WILMINGTON EN ROUTE TO SOUTHPORT, SEPTEMBER 7, 1892.

The meeting was called to order by the President, Dr. H. T. Bahnson. On motion, Dr. F. P. Venable acted as Secretary *pro tem.* Dr. Lewis moved that Dr. Hodges be appointed a committee of one to draft suitable resolutions on the death of Dr. Wood. This was carried. The Board next proceeded to the election of a member to fill the vacancy caused by the death of Dr. Wood. Dr. Tucker nominated Dr. George G. Thomas of Wilmington, and as there was no further nomination he was elected by acclamation Dr. Thomas was then introduced to the Board. Nominations for the office of Secretary being in order, Dr. Hodges put in nomination the name of Dr. R. H. Lewis, of Raleigh. The Secretary was instructed to cast the vote of the Board for Dr. Lewis, and Dr. Lewis was declared elected.

Dr. Thomas made mention of certain telegrams and other communications received and answered by him in the interim between the former Secretary's death and the present meeting. President Bahnson also mentioned action taken by him. On motion of Dr. Lewis, these actions were endorsed by the Board.

Dr. Hodges suggested that President Bahnson issue an address to the people of the State embodying the results of the Board's examination of the quarantine at Southport. This address was to be signed by the entire Board.

The Board proceeded to their examination of the quarantine methods and facilities, adjourning the meeting until 8 p. m. F. P. VENABLE, *Secretary pro tem.*

Returning to Wilmington the Board reassembled in its own office. The following resolutions of respect to the memory of the late greatly admired and beloved Secretary were read by Dr. Hodges and unanimously adopted:

WHEREAS, The Almighty Ruler of the universe has seen fit in His infinite wisdom to remove from our councils our worthy Secretary and Treasurer, Dr. Thomas F. Wood: therefore be it

Resolved, That in his death our Board has sustained a great and irreparable loss, that affects not only its members, but also the well-being of our profession and of the people throughout the State as well.

Resolved, That we desire in this connection to place upon record our estimate of his long, faithful and efficient services in behalf of public sanitation in North Carolina, for we recognize that the North Carolina Board of Health had its inception through his labors and influence, and that it has been sustained and brought to its present state of efficiency directly by his personal endeavors and individual pecuniary sacrifices.

Resolved, That we desire, furthermore, to express our appreciation and admiration of his eminent services to the medical profession, for we are assured that, by his superior learning and marked ability, as much as by his pure and unblemished Christian life and character, he has dignified and elevated the profession in our State, and has earned for himself a name and influence that, reaching out to other States and countries, has reflected credit and honor not only upon his own profession, but upon his native State that he loved so well.

Resolved, That we desire to express to the family of the deceased our lasting and unfeigned sorrow, and assure them of our earnest and heartfelt sympathy in this, their sad bereavement.

Resolved, That the Secretary of this Board furnish copies of the above, for publication, to the *North Carolina Medical Journal* and to the newspapers of Wilmington, with the request that they be copied by the press of the State, and that a copy be also sent to the family of our deceased member.

On motion, the following report of the Board's investigation of the Quarantine Station at the mouth of the Cape Fear River was formulated.

The State Board of Health visited the Quarantine Station at Southport on the 7th of September, 1892.

Dr. W. G. Curtis, the quarantine physician, laid before the Board the means adopted by himself to deal with vessels coming to his Station. They consisted in emptying the vessel of ballast and other matter in hold, washing out bilge, fumigating with sulphur and washing with solution of bichloride of mercury. The Board was satisfied that the officials in charge of the quarantine were fully aware of the responsibilities attached to their office and were using all means at their command to preserve a good quarantine service. The need of a hospital for treatment of persons arriving at the station sick of infectious disease was especially commented on, and also the necessity for a house for the detention and observation of all persons not diseased but part of infected ship's company, and more elaborate apparatus for disinfection of clothing and bedding from same ship. They wish, however, to express their confidence in the ability of the Board of Quarantine to cope with ordinary emergencies in the present condition of the shipping at this port; but should a cholera-infected ship arrive the State officials would be called upon to aid them by a liberal contribution from the fund provided for such cases.

The Secretary was, on motion, authorized to make such purchases of office apparatus as might be necessary for properly furnishing his office.

The itemized statement of the Treasurer to September 1 was read, and on motion, accepted.

The Secretary asked for the opinion of the Board in regard to sundry plans for increasing the usefulness of the Board and bringing it more conspicuously before the people. Several schemes were proposed and discussed by all the members.

The Secretary called attention to the fact that the present cost of issuing the *Bulletin* exceeded the appropriation for printing, and though nothing had been said in relation thereto by the Auditor, he did not feel authorized to continue the present arrangement without the authority of the Board.

On motion, it was decided to continue the *Bulletin* without change.

Dr. Hodges asked the consideration by the Board of the unequalized payment of Superintendents of Health in the different counties, stating that he would give at a future meeting the result of some investigations he had been making in this matter.

The Board then adjourned *sine die.*

RICHARD H. LEWIS, M. D.,
Secretary.

H. T. BAHNSON, M. D.,
President.

REPORT OF TREASURER FOR TWO YEARS ENDING DECEMBER 31, 1892.

1891.		Expenditures.	
Jan.	2.	Postage, box-rent	$ 1 50
	2.	Subscription to *Sanitarian* for members for 1891	28 00
	2.	J. A. Hodges, expenses to Raleigh Conference of State Asylum Superintendents	16 50
	2.	F. P. Venable, balance on expenses to meeting American Public Health Association	8 35
	8.	Myers Bros., Columbus, O., for Transactions of Conference of State Boards of Health	12 00
	10.	Express on *Bulletin*	75
	10.	Postage on *Bulletin*	25
	11.	Postage	32
	13.	Postage	1 40
	13.	R. H. Lewis, balance on expenses to meeting American Public Health Association	7 00
	14.	S. G. Hall, printing	20 00
	29.	G. P. Putnam's Sons	17 50
	29.	Express	1 30
Feb.	7.	Postage	32
March	2.	*Bulletin*, express on	65
		Postage on *Bulletin*	33
		Postage stamps	1 50
	10.	Putnam's bill	26 50
		Postal cards	4 00
April	6.	Postage stamps	1 00
	6.	Salary of Secretary and assistant, first quarter 1891,	300 00
		Express on *Bulletin*	65
	7.	Postage on *Bulletin*	35
	8.	S. G. Hall, printing	1 25
		Post-office box-rent	1 25
	17.	Express charges	3 30
May	7.	Express on *Bulletin*	65
	10.	Postage on *Bulletin*	37
	13.	Telegram to E. & B	25
	12.	C. W. Yates, stationery	7 20
	29.	Thomas F. Wood, expenses Asheville meeting	52 45
		H. T. Bahnson, “ “ “	35 00
		F. P. Venable, “ “ “	36 00
		R. H. Lewis, “ “ “	50 00
		J. A. Hodges, “ “ “	40 00
		J. H. Tucker, expenses Asheville meeting	33 05
		R. D. Jewett, “ “ “	28 70

May	29.	Freight on boxes to Asheville—Bd. of Health matter	$ 7 90
June	1.	Freight on boxes from Raleigh	1 42
	4.	Express on *Bulletin*	70
		Transactions Conference State Boards of Health	10 00
	6.	R. M. McIntire, carpet for office	32 05
	11.	A. B. Cook, repairs and shelving	5 50
		Subscription to *Sanitary News*	14 08
	15.	Postage on Third Biennial Report	7 36
		Anton Metz, for translations, etc	20 00
		Freight on box from Asheville—Bd. of Health matter	2 68
	30.	Salary Secretary and Clerk, 3 months	300 00
July	2.	Express on book	35
		C. I. Comfort, typewriter ribbon	1 00
	17.	P. Blakiston, Son & Co	10 34
		C. W. Yates	4 05
	21.	Postage stamps	50
Aug.	5.	Express on *Bulletin*, July and August	1 30
		Postage " " " "	1 00
	10.	Postage stamps	3 24
	15.	W. C. Conant, *Sanitary Era*	13 50
Sept.	7.	Express and postage on *Bulletin*	1 29
		Postage stamps	50
		Westlake Co., Reports Conf. State Boards of Health	6 00
		Express on Conference Reports	1 70
	15.	Postage stamps	50
	30.	Salary of Secretary and Clerk for quarter ending September 30, 1891	300 00
Oct.	2.	W. L. DeRosset, engraving	8 00
	9.	Post-office box-rent	1 50
		Postage and express on *Bulletin*	1 00
Nov.	10.	Express on reprints	55
	18.	Postage stamps	2 30
		Express on *Bulletin*	75
Dec.	3.	" " and postage stamps	3 35
	31.	Office rent for 1891	60 00
		Salary of Secretary and Clerk for quarter ending December 31	300 00
1892.			
Jan.	13.	Postage and express on *Bulletin*	95
		Postage stamps and box-rent	2 50
	19.	C. I. Comfort, typewriter supplies	2 80
	24.	LeGwin Bro.'s bill	4 50
	28.	Postage	1 00
		C. W. Yates' bill	4 95
		Subscription News Co., *Sanitary Journal*	8 75
Feb.	12.	C. I. Comfort, typewriter supplies	2 60

Feb.	18.	Express and postage on *Bulletin*	$ 1 00
		Postage stamps	1 00
	27.	Postage on pamphlet, "Care of the Insane"	3 25
March	9.	Postal cards	3 00
	21.	Wm. R. Jenkins, "Walley's Meat Inspection"	3 60
	29.	Express and postage on *Bulletin*	90
	31.	Salary Secretary and Clerk, quarter ending with March, 1892	300 00
April	16.	LeGwin Bros.' bill	1 50
		Express and postage on *Bulletin*	1 00
May	3.	Postage	1 00
	4.	Subscription to *Sanitarian*	28 00
	19.	Thomas F. Wood, per diem, meeting May, 1892	12 00
		S. W. Battle, per diem and expenses, meeting May, '92.	27 00
		H. T. Bahnson, " " " "	42 00
		R. H. Lewis, " " " "	11 55
		F. P. Venable, " " " "	29 60
		J. M. Baker, " " " "	23 00
June	3.	Express and postage on *Bulletin*	1 00
	9.	Postage stamps	1 00
	13.	C. I. Comfort, repairing typewriter	5 00
		F. P. Venable, analysis	5 00
	30.	Salary of Secretary, quarter ending June 30, 1892	300 00
July	7.	Express and postage on *Bulletin*	1 00
	27.	LeGwin Bros.' bill	2 50
		Western Union Telegraph Co	25
Aug.	5.	Express and postage on *Bulletin*	1 00
	16.	J. A. Hodges, per diem and expenses meeting in May, and Rex Hospital inspection	29 50
	31.	Postage stamps	30
		Salary of Secretary for July and August	200 00
		Office rent to date, 8 months	40 00
Sept.	12.	H. T. Bahnson, per diem and expenses meeting at Wilmington, September 7, 1892	28 25
		F. P. Venable, per diem and expenses meeting at Wilmington, Sept. 7, 1892	29 85
		J. A. Hodges, per diem and expenses meeting at Wilmington, Sept. 7, 1892	15 90
	15.	J. H. Tucker, per diem and expenses meeting at Wilmington, Sept. 7, 1892	26 15
	19.	W. H. Harrell, per diem and expenses meeting at Wilmington, Sept. 7, 1892	27 50
	19.	G. G. Thomas, per diem meeting at Wilmington, Sept. 7, 1892	4 00
	21.	W. L. Elder, 1 office desk	15 00

Sept.	24.	Express on typewriter from Wilmington	$	85
	27.	Express on mailing list		25
	28.	One blank-book		25
	30.	Mrs. Mary S. Wood, executrix, salary of Secretary for September		100 00
Oct.	1.	Express on map		25
	3.	A. S. Lewter, agent, freight on 8 boxes from Wilmington		11 53
	4.	Express on microscope		60
	4.	Hauling 8 boxes from depot		60
		Postage stamps and postal cards		10 00
	7.	Hauling office furniture from depot		50
		A. S. Lewter, agent, freight on office furniture		3 90
		Mending office carpet		35
	8.	Paid Mitchell, work in office		1 45
		Paid Andrews, " "		1 25
		Two ounces benzine for cyclostyle		10
	10.	R. D. Jewett, packing and shipping office furniture, books, etc., and hauling, $8.20; printing slips for *Bulletin*, $2.00; Yates' bill, $3.00; binding *Bulletin*, $1.25; express on *Bulletin*, August, 70c.; postage on *Bulletin*, July, 30c ; August, 37c., stamps and lock for typewriter, 81c		16 63
	11.	A. S. Lewter, freight on desk for office		1 58
		Hauling desk from depot		20
	13.	Postage, 3d class, on September *Bulletin*		2 64
Nov.	1.	Salary of Secretary for October		100 00
Dec.	1.	Salary of Secretary for November		100 00
	5.	Raleigh Stationery Co., letter-press, copying-book, brush, ink		6 40
		Subscription to *Sanitary Era* for the Board		4 50
	31.	Postage stamps and postal cards		10 00
		Salary of Secretary for December		100 00
		Five hundred postal cards furnished printer November 10		5 00
		R. H. Lewis, per diem and expenses meeting at Wilmington, Sept. 7, 1892		25 70
		Postage on *Bulletin*, 3d class, October and November		4 00
		North Carolina Car Co., 1 book-case		8 00
		Office rent to date, 3 months		15 00
		Balance on hand		530 29
				$4,176 52

RECEIPTS.

Amount on hand January 1, 1891	$ 176 52	
Appropriation for year 1891	2,000 00	
Appropriation for year 1892	2,000 00—	4,176 52

TABLE 1. DISEASES PREVAILING IN THE STATE FOR THE YEAR 1891, BY COUNTIES.

The following tables are intended to present in a condensed shape for reference the most prevalent diseases occurring in the different counties each month during the two years ending December 31, 1892. The tables are made up from the reports received each month from the Superintendents of Health. Taking any one county, it only requires to follow the line devoted to it to learn the general diseases common at the various seasons in that county; or for any one month, it is an easy matter to cast the eye down the list of counties and compare the diseases occurring at the same time in different portions of the State.

COUNTIES AND REPORTERS	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Alamance — Dr G W Long, Graham	Influenza chicken cholera	Varicella catarrhal fever, pneumonia, bronchitis, and typhoid fever	Influenza (severe) and measles	Influenza (abating) and dysentery	Influenza has subsided catarrhal dysentery	No epidemic	Typhoid a few malarial fevers	Malarial fever and jaundice	Diphtheria malarial fever occasional case typhoid epidemic jaundice	Typhoid fever measles	Epidemic of catarrh typhoid fever (few) and jaundice	Influenza and epidemic catarrh (very extensive)
Alexander — Dr J H Mallo, Taylorsville	Whooping-cough and typhoid fever	Influenza whooping-cough typhoid fever (1) staggers in horses	Influenza and pneumonia staggers in horses	No diseases reported	Little sickness typhoid fever (1) and mild intestinal affections	Typhoid fever (mild) measles and dysentery	Typhoid fever (1) distemper in horses	Typhoid fever	Typhoid fever and whooping-cough	Diphtheria and typhoid fever (3)	Bronchitis, tonsillitis and rheumatism	Influenza and typhoid fever (1) hog cholera
Beaufort — Dr E T Nicholson, Washington	—	—	—	—	—					—	—	—
Bladen — Dr N Robinson, Elizabethtown	No epidemic pneumonia	Measles —	Measles and whooping cough									—
Buncombe — Dr H B Weaver, Asheville	—	—	Measles whooping-cough diphtheria scarlatina typhoid fever influenza		—	—		Typhoid fever ([illegible]) —	Typhoid fever and diphtheria (1)	—	—	—
Burke — Dr J L Laxton, Morganton	—	—	—	—		—		Whooping cough and typhoid fever hog cholera	Whooping-cough and typhoid fever hog cholera	Whooping cough (1) and typhoid fever (7)	Typhoid fever (6)	Influenza and pneumonia typhoid fever (1)
Cabarrus — Dr R S Young, Concord, till Sept	—	Whooping-cough diphtheria typhoid and hemorrhagic malarial fever (1)	Whooping-cough measles and typhoid fever	Whooping-cough and measles	Whooping cough	No diseases reported	Typhoid fever (1)	Diphtheria and typhoid fever	—	—	—	—
Caldwell — Dr A A Kent, Lenoir	—	—	Influenza and pneumonia	Influenza and pneumonia	No diseases reported. Distemper in horses	A few cases of dysentery and cholera morbus typhoid fever (1)	Typhoid fever	Typhoid fever (mild) —	Typhoid fever (4) and diphtheria (1) of mild type	Typhoid fever ([illegible]) diphtheria (2)	Influenza catarrhal bronchitis pneumonia tonsillitis typhoid fever jaundice cholera infantum (few of each)	Influenza (extensive) typhoid fever (5) whooping-cough (6)
Carteret — Dr M F Arendell, Morehead City	—	No diseases reported	Influenza (mild)	—	Measles —	Measles —	Measles	Measles	Measles —	Measles —	Little sickness	Influenza (extensive) measles whooping-cough
Caswell — Dr H B Williamson, Yanceyville	Influenza typhoid and intermittent fevers	Pneumonia and influenza	Influenza and pneumonia croup and bronchitis in children	Influenza pneumonia remittent fever and rheumatism	Dysentery and rheumatism	Dysentery and malarial fever	Remittent fever and rheumatism	Malarial and typhoid fevers	Remittent typhoid and typho-malarial fevers	Malarial and typho-malarial fevers (typhoid pneumonia)	Influenza and pneumonia	Influenza pneumonia and typhoid fever
Catawba — Dr J M McCorkle, Newton, till August then Dr S W West, Newton	Influenza measles, diphtheria and jaundice		Measles mumps whooping cough	—	—	Typhoid fever whooping cough and measles	Typhoid fever and whooping cough	—	Whooping-cough and typhoid fever	Whooping-cough (3) and typhoid fever (4)	Typhoid fever (6)	Influenza (extensive) and typhoid fever (4)
Chatham — Dr H T Chapin, Pittsboro	Influenza and measles	Influenza and pneumonia	Influenza pneumonia varicella and scarlatina (limited)	Influenza —	Some dysentery	Dysentery hog cholera	Typhoid fever	Typhoid and pernicious malarial fever (1)	Malarial fever (few cases)	Little sickness. Nature of diseases not given	Few cases of measles and intermittent fever	Influenza
Cherokee — Dr J F Abernathy, Murphy	Influenza and meningitis	—	Influenza —	Measles and diphtheria (1)	Measles dysentery and typhoid fever (1)	No epidemics —	Typhoid fever [illegible] (4)	Typhoid fever (mild) —	No typhoid (new cases) hog cholera	No diseases reported —	Influenza and continued fever hog cholera	Influenza and complications
Chowan — Dr R H Winborne, [illegible] till April	—	—	Influenza pneumonia and diphtheria	—	—	—	—	Typhoid fever —	—	—	—	—
Cleveland — Dr O P Gardner, Shelby	Pneumonia and whooping cough	No diseases reported	Influenza and pneumonia	Influenza and whooping cough	Typhoid fever (1) —	Typhoid fever and dysentery	Typhoid fever and measles	—	Measles, diphtheria and typhoid fever	Typhoid fever —	Whooping-cough (3) —	Influenza and pneumonia
Columbus — Dr Isaac Jackson, Whiteville	Influenza typhoid fever (1 case)	Influenza and measles —	Measles —	Typhoid fever (2)	Typhoid fever (1) —	Typhoid fever (1)	Typhoid fever	Typhoid fever, less malarial fever than usual	Typhoid fever (3) malarial fever hog cholera	Typhoid fever (1) —	Typhoid fever (1) cholera in hogs	Influenza (mild)
Craven — Dr L Duffy, Newbern	—	—	Influenza diphtheria scarlatina measles mumps	—	Measles mumps, whooping-cough	—	Malarial fevers and bowel affections	—	—	—	—	—
Cumberland — Dr J H Marsh, Fayetteville	Measles —	Measles —	Nature of diseases not given	Influenza pneumonia, catarrhal and malarial fevers	Malarial and bowel affections	No diseases reported	Nature of diseases not given	Measles (1) —	Whooping-cough malarial and typhoid fevers	—	Nature of diseases not given	Influenza
Davidson — Dr R L Payne Jr, Lexington	No diseases reported	No diseases reported little sickness	Small pox (2) isolation and vaccination practiced	Measles —	Measles —	Measles whooping-cough	Measles whooping-cough hog cholera	Whooping-cough cholera in hogs	—	Whooping-cough and influenza	Influenza diphtheria and whooping-cough	Mumps and whooping cough
Duplin — Dr J W Blount, Kenansville	Measles influenza more severe with pneumonia	Influenza pneumonia and measles	Influenza pneumonia and measles	No diseases reported	—	Mumps dysentery, diarrhoea, malarial fevers	Malarial and typhoid fevers hog cholera	Malarial and typhoid fevers diarrhoea and dysentery hog cholera	A few cases of malarial and typhoid fevers (mild)	Malarial and typhoid fevers limited cholera in hogs	Little sickness	—
Durham — Dr N M Johnson, Durham	Nature of diseases not given	Influenza pneumonia and scarlatina (slightly)	Nature of diseases not given	Measles —	Measles —	Measles —	Little sickness pink eye in horses	No diseases reported —	Nature of diseases not given	No epidemics —	Little sickness —	Influenza (rather more severe than last year)
Edgecombe — Dr Donald Williams, Tarboro	Epidemic of scarlatina has ceased	Measles and scarlatina (2)	Measles and scarlatina	Measles	Dysentery (obstinate)	Measles and diarrheal diseases	Malarial fever —	Malarial fevers —	Malarial fevers —	Little sickness. Nature of diseases not given	Little sickness —	Health good, no diseases reported
Forsyth — Dr D N Dalton, Winston	—	—	Influenza pneumonia whooping-cough measles typhoid fever (2)	—	—	—	—	Whooping-cough and typhoid fever	—	—	—	—
Franklin — Dr E S Foster, Louisburg	Measles —	Measles —	Measles —	Measles (mild) pernicious malarial fever (3)	Measles dysentery and other bowel complaints	Typhoid and typho-malarial fevers	Typhoid and typho-malarial fevers (mild)	Typhoid fever —	—	Typhoid fever (mild)	Little sickness no diseases to report	Influenza (mild)
Gaston — Dr J D H Hand, Dallas, till Sept	Influenza —	Influenza and pneumonia	Influenza and pneumonia	Measles and influenza	Whooping-cough typhoid fever and pneumonia	Typhoid fever and pneumonia	Typhoid and malarial fevers summer complaints in children	Malarial and typhoid fevers	Typhoid fever —	—	—	—
Granville — Dr J M Hays, Oxford, till Aug, then Dr Patrick Booth, Oxford	—	Nature of diseases not given	Influenza and measles (quite abundant)	No diseases reported	Varicella —	Health unusually good	—	Nature of diseases not stated	Measles, whooping cough, malarial and typhoid fevers	Malarial and typhoid fevers	Influenza and whooping cough hog cholera	Influenza bronchitis and pneumonia, whooping cough (limited)
Greene — Dr L H Sugg, Snow Hill	Influenza and pneumonia, typhoid and other fevers	Influenza and pneumonia	Influenza pneumonia and varicella	Malarial fevers dysentery chicken pox and pernicious malarial fever (1)	Dysentery and measles ([illegible])	Influenza dysentery typhoid and malarial fevers	Malarial and typhoid fevers dysentery	Malarial fever typhoid and follicular tonsillitis	Malarial and typhoid fevers follicular tonsillitis [illegible] staggers in horses	Malarial fever measles and acute cerebral meningitis (1)	Malarial fever and scabies	Influenza (general) pneumonia and typhoid fever distemper in horses
Guilford — Dr E R Michaux, Greensboro	—	Measles malarial fever pneumonia and pleurisy	Pneumonia (severe) influenza bronchitis malaria distemper in horses and dogs	Influenza measles pneumonia malarial fever	Malarial and a few typhoid fevers diarrhoea and dysentery	Very little sickness, bowel affections and malarial fevers	Malarial fever	Malarial fever typhoid fever few	—	—	Influenza and pneumonia malarial fevers and varicella	—
Halifax — Dr J E Pierce, Weldon	Measles whooping-cough influenza and catarrhal fever	Measles scarlatina diphtheria (1) and catarrhal fever influenza	—	Influenza measles tonsillitis	Dysentery and infantile diarrhoea	Dysentery and infantile diarrhoea	Malarial fever and dysentery	Malarial fever (mostly continued)	Malarial and typho-malarial fevers	Catarrhal fever and malaria chicken cholera	Catarrhal fever tonsillitis and mumps	—
Haywood — Dr R L Allen till September then Dr J H Way, both of Waynesville	—	—	—	—	No diseases to report	—	—	—	—	—	Catarrhal affections of air passages cholera in hogs and epizootic in horses	—
Henderson — Dr W B Brice, till Sept, then Dr J L Egerton, both of Hendersonville	Influenza and pneumonia diphtheria (two cases) rheumatism	—	Pneumonia and measles	—	—	—	—	—	—	—	Diphtheria (1) —	Influenza
Iredell — Dr M W Hill, Statesville	Pneumonia and bronchitis	Pneumonia bronchitis influenza measles, erysipelas diabetes membranous croup	—	Measles	Measles diarrhoea pernicious malarial fever dysentery	Measles, whooping cough and typhoid fever (1)	Malarial and typhoid fevers measles whooping cough and cholera morbus a few of each	Whooping-cough malarial and typhoid fevers	Whooping-cough malarial and typhoid fevers (few)	Some typhoid and malarial fever catarrhal affections and whooping cough	Whooping-cough typhoid and intermittent fevers (limited)	Influenza pneumonia varicella whooping-cough rheumatism and tonsillitis (a few of each)
Jackson — Dr J M Candler, Dillsboro	Measles —	Measles (mild) —	Measles —	Measles and pneumonia —	Typhoid fever (3) and hemorrhagic malarial fever (1)	Free from epidemics —	Free from epidemics hog cholera	Health excellent free from fever	Scarlatina diphtheria typhoid fever (few of each) hemo-malarial fever (1)	Diphtheria and typhoid fever	Diphtheria (1) and typhoid fever (4)	—
Johnston — Dr J J Sasser, Smithfield		Measles whooping-cough bronchial and malarial troubles distemper in horses and mules hog and chicken cholera	Influenza whooping cough and measles	Measles and whooping cough bowel complaints	Measles and typhoid fever (1)	Measles whooping cough typhoid fever (1) and malarial fever	Malarial fever and typhoid fever (4)		Malarial and typhoid fevers (few) 1 pernicious malarial hog cholera	Malarial fever measles typhoid fever (4)	Bronchial and pulmonary troubles hog cholera	Influenza and bronchial troubles
Jones — Dr J B Woodley, Trenton, till May	Influenza pneumonia and malarial fever	Influenza and bronchitis	Pneumonia bronchitis influenza and mumps	Influenza bronchitis and pneumonia	—	—	—	—	—	—	—	—
Lenoir — Dr C B Woodley, Kinston, from Sept	—	—	—	—	—	—	—	—	Intermittent fever and typhoid (1)	Intermittent fever —	No diseases to report —	Whooping-cough ([illegible]), pneumonia. Influenza general. Some malarial fever ([illegible])
Lincoln — Dr W L Crouse, Lincolnton	Influenza —	Influenza and jaundice	Bronchial troubles whooping-cough	Whooping cough and measles	—	Measles whooping-cough dysentery in children and typhoid fever	Measles whooping cough and typhoid fever	—	Typhoid fever and diphtheria	Whooping-cough typhoid fever and diphtheria ([illegible])	—	Influenza, bronchial and catarrhal affections
Macon — Dr J M Lyle, Franklin	Influenza 1 case of diphtheria and 2 of typhoid fever	Influenza and measles —	Influenza —	—	Influenza and measles ([illegible])	Influenza —	Typhoid fever ([illegible])	Diphtheria mild but extensive hog cholera	Typhoid fever ([illegible]) and diphtheria	Diphtheria and typhoid fever ([illegible]) cholera in animals	Influenza, diphtheria (4) and typhoid fever ([illegible])	Typhoid fever ([illegible]) cholera in hogs
Martin — Dr W H Harrell, Williamston	Mumps pneumonia bronchitis catarrhal fever some typhoid fever and 3 of hemorrhagic malarial fever	Mumps measles bronchitis pneumonia and hemorrhagic malarial fever (1 case)	Influenza (mild) and catarrhal affections		Typhoid fever (3) scarlatina malarial fever diarrhoea and dysentery	Diarrhoea and dysentery typhoid and malarial fevers scarlatina [illegible]		Malarial and typhoid fevers (mild but extensive) 3 of hemorrhagic malarial fever diarrhoea	—	Typhoid fever (3) bronchitis malarial fever (1), ulcerated sore throat	Measles and catarrhal fever (both extensive) dysentery and hemorrhagic malarial fever	
McDowell — Dr J H Gilkey, Marion	Pneumonia and bronchitis catarrhal fever	Influenza bronchitis and pneumonia	Catarrhal affections	Influenza and catarrhal affections	Bronchial and catarrhal affections	Diarrhoea dysentery and cholera infantum	Typhoid fever and cholera infantum	Typhoid fever bowel complaints diphtheria (1) distemper in horses	Typhoid fever ([illegible]) distemper in cattle	Typhoid fever and diphtheria distemper among cattle	Catarrhal trouble and typhoid fever	Influenza (catarrhal) some pneumonia and bronchitis distemper in horses
Mitchell — Dr C E Smith, Bakersville	Influenza jaundice and typhoid fever (2 cases)	Influenza hog cholera —	Influenza (abundant), typhoid fever (1) whooping cough	Influenza distemper in horses	Measles mild; very little sickness	Diarrhoea measles ([illegible]) typhoid fever (3) whooping cough (2)	—	—	Typhoid fever (2) influenza whooping-cough	—	Tonsillitis (extensive) measles ([illegible]) typhoid fever ([illegible])	No epidemic except distemper in horses
Montgomery — Dr F S Asbury, Asbury, from March			Measles —	No diseases reported		Typhoid fever (5) —	Hemorrhagic malarial fever ([illegible]) typhoid fever ([illegible])	Scarlatina typhoid fever pernicious and hemorrhagic malarial fevers	Diphtheria typhoid pernicious malarial (5) and hemorrhagic malarial (1) fevers, cholera in domestic animals	No diseases to report cholera in domestic animals	Whooping cough (5) scarlatina (2) diphtheria (8) and typhoid fever (3)	Influenza (50 cases reported) 10 cases bronchitis and pneumonia diphtheria (5), hog cholera
Moore — Dr Gilbert McLeod, Carthage	Influenza bronchitis and tonsillitis meningitis	Influenza tonsillitis and measles	Measles whooping-cough influenza, no more meningitis	Measles whooping cough and dysentery	Measles (subsiding) diarrhoea and dysentery	—	Little sickness cholera in hogs	Malarial fevers and a few of typhoid	Measles ([illegible]) and typhoid fever ([illegible])	—	—	Influenza (extensive) complicated with pneumonia in some cases
Nash — Dr G W Lewis, Spring Hope, till Nov	Influenza typhoid fever and diphtheria	Varicella typhoid fever and pneumonia	Measles (mild) —	Measles —	Measles and intermittent fever	Dysentery and remittent fever hog cholera	Whooping cough malarial and typhoid fevers	Whooping-cough malarial and a few cases typhoid fever	Whooping-cough malarial and typhoid (few) fevers	Malarial and typhoid fevers whooping-cough chicken and hog cholera	—	—
New Hanover — Dr F W Potter, Wilmington	Influenza diphtheria and measles (2 cases of each)	Measles whooping-cough and hemorrhagic malarial fever	Measles influenza diphtheria (2) typhoid fever (3) pernicious and hemorrhagic malarial fever (2 each)	Influenza measles whooping-cough and typhoid fever (1)	Typhoid fever (3) whooping-cough (5) measles influenza	Measles whooping cough typhoid fever diphtheria (1) malarial fever (1 pernicious)	Continued and typhoid fevers measles whooping cough	Whooping cough measles (1) typhoid pernicious (2) and hemorrhagic-malarial (1) fevers	Whooping-cough typhoid fever and diphtheria (1)	Measles (4) typhoid fever (8) and whooping cough (5)	Whooping cough typhoid fever (4) diphtheria (1) and hemorrhagic malarial fever (1)	Influenza (extensive) and whooping-cough
Northampton — Dr H W Lewis, Jackson	Influenza typhoid and 1 case hemorrhagic malarial fever distemper in horses		—	Whooping-cough and typhoid fever (2)	—	—	—	—	—	—	—	—
Onslow — Dr J L Nicholson, Richlands, till Aug, then Dr E L Cox, Jacksonville	Influenza mumps scabies malarial fever and gastro enteritis	Influenza mumps bronchitis and measles	Influenza (abundant), typhoid fever (2), measles	Influenza, measles dysentery and mumps	Measles some dysentery and malarial fever	—	Malarial and typho-malarial fevers	—	Typhoid pernicious and hemorrhagic malarial fevers (all limited in number), measles staggers chicken cholera	Typhoid fever (2) dysentery (severe) chicken cholera	Diphtheria (1) and hemorrhagic malarial fever (1)	Influenza (extensive) and diphtheria (1)
Orange — Dr D C Parris, Hillsboro	Pneumonia catarrhal fever and bronchitis	Catarrhal diseases —	Bronchitis pneumonia, influenza rheumatism and measles	Measles and catarrhal affections	Measles diarrhoea dysentery	Measles diarrhoea dysentery influenza typho-malarial fever [illegible]	Measles pneumonia influenza bowel complaints malarial typhoid (2) and typho-malarial fevers, chicken cholera	Measles, typhoid and malarial fevers	Malarial and typhoid fevers	Measles (2) typhoid fever (5) whooping cough (2), influenza (1, fatal)	Catarrhal fever extensive influenza (limited) and typhoid fever (2)	Influenza with pneumonia
Pender — Dr S S Satchwell, Burgaw	Influenza	Influenza and pneumonia	Influenza measles and typhoid fever	No diseases reported	Bowel complaints cholera in hogs	Cerebro-spinal meningitis (extensive and fatal) malarial and typhoid fevers hog cholera	No diseases reported hog and chicken cholera	Malarial (1) hemorrhagic and typhoid fevers	Nature of diseases not given hog cholera	Malarial typho-malarial and typhoid fevers, hog cholera	Malarial and typhoid fevers hog and chicken cholera	Nature of diseases not given improvement in sanitation chicken and hog cholera
Pitt — Dr B T Cox, Redalia	Pneumonia bronchitis and malarial fever	Influenza, bronchitis, measles and malarial fevers	Bronchitis pneumonia influenza measles whooping-cough, malaria distemper in horses cholera in hogs	Influenza, bronchitis and pneumonia, hog cholera and distemper in horses	Dysentery chicken and hog cholera	—	Typhoid and malarial fevers diarrhoea and dysentery	Malarial pernicious and hemorrhagic and typhoid fevers whooping-cough hog and chicken cholera pink-eye and staggers	Whooping-cough typhoid and malarial fevers distemper pink eye and staggers in horses	Malarial and typhoid fevers pneumonia (1) and whooping-cough	Whooping-cough measles typhoid and malarial fevers	—
Polk — Dr Henry Shankle, Mills Springs	Typhoid fever —	Influenza pneumonia and mumps	Influenza pneumonia typhoid fever (1) mumps	—	Acute peritonitis —	—	—	—	—	—	—	—
Randolph — Dr J W Long, Randleman, till Aug, then Dr J M Hoyette, Ashboro	Measles whooping-cough diphtheria typhoid fever pernicious and 1 case of hemorrhagic malarial fever cholera morbus	Bronchitis pneumonia influenza measles diphtheria (2) typhoid fever (1) and cholera (1)	Pneumonia whooping cough (abundant) influenza typhoid fever ([illegible]) diphtheria (1) hemorrhagic malarial fever (1)	Whooping-cough measles pneumonia typhoid fever (1) diphtheria (1) staggers and pink eye in horses hog cholera	Dysentery (general) measles influenza bronchitis pneumonia and pernicious malarial fever (1)	Measles whooping-cough typhoid fever dysentery diphtheria cholera morbus [illegible] pernicious malarial fever (1)	Malarial and typhoid fevers bowel diseases	Typhoid fever ([illegible]) —	Typhoid fever hog cholera	Malarial fever whooping cough and typhoid fever (2)	Whooping cough typhoid fever ([illegible]) influenza and pneumonia (extensive) hog and chicken cholera	Measles whooping-cough diphtheria ([illegible]) and typhoid fever (3)
Richmond — Dr J M Covington, Rockingham	Bronchitis pneumonia influenza measles whooping cough scarlatina ([illegible]) diphtheria (4) typhoid fever ([illegible])	Influenza —	Influenza and catarrhal affections scarlatina (4)	Scarlatina —	Whooping cough scarlatina typhoid fever (3) acute catarrhs and bowel affections	Measles whooping-cough typhoid fever ([illegible]) and dysentery (mild)	Measles whooping-cough malarial fevers typhoid fever and diphtheria ([illegible])	Typhoid and malarial fevers diphtheria	Whooping-cough malarial and typhoid fevers scarlatina ([illegible]) and diphtheria ([illegible])	Whooping cough scarlatina ([illegible]) and typhoid fever (3)	Influenza (mild) and typhoid fever (5)	Influenza and measles
Robeson — Dr R F Lewis, Lumberton	Influenza and measles	Measles and whooping cough	No diseases reported —	Measles hog cholera	Measles and bowel affections hog cholera	Measles and typhoid fever	Little sickness cholera in hogs	Little sickness cholera in hogs	No diseases reported —	Nature of diseases not given	Little sickness —	Influenza (general)
Rowan — Dr J J Summerell, Salisbury	Whooping cough typhoid fever influenza staggers in horses	Influenza bronchitis and pneumonia	Influenza catarrhal measles whooping-cough	Whooping-cough influenza typhoid fever (1) and pneumonia	Measles whooping cough	Measles whooping-cough and typhoid fever	—	Malarial fevers typhoid fever (few) and diphtheria (1)	Malarial and typhoid fevers (few)	Whooping-cough (2) diphtheria (2) typhoid fever (3) malarial fever on creeks	Whooping-cough diphtheria and influenza (mild)	Influenza (mild except when followed by pneumonia)
Rutherford — Dr W J Thompson, Cliffdale	Influenza typhoid fever (1) and pneumonia	Influenza —	Influenza and pneumonia		Nature of diseases not given	Typhoid fever cholera in hogs and pink-eye in horses	—	Measles whooping-cough (few)	Measles whooping-cough and typhoid fevers	Measles whooping-cough and typhoid fever (a few of each)	Very healthy —	Influenza and measles
Sampson — Dr J A Stevens, Clinton	Bronchitis pneumonia influenza measles whooping cough	Influenza bronchitis malarial fever pneumonia and measles	Bronchitis pneumonia influenza and measles	Whooping-cough measles influenza malarial fever and pneumonia hydrophobia in domestic animals	Measles whooping cough influenza diarrhoea typhoid fever (1) and dysentery	Measles whooping-cough, diarrhoea, dysentery and malarial fevers	Measles whooping-cough bowel diseases malarial and typhoid fevers	Malarial and typhoid fevers bowel diseases hog cholera	Malarial and typhoid (extensive) fevers dysentery diarrhoea tonsillitis and catarrhal troubles	Typhoid and typho-malarial fevers remittent fever dysentery and cholera infantum	Bronchitis pneumonia influenza malarial and typhoid fevers	—
Stanly — Dr D P Whitley, [illegible]		Bronchitis pneumonia influenza and whooping cough	Influenza measles pneumonia whooping-cough distemper in horses	Whooping cough measles typhoid fever (2) and pernicious malarial fever (1) distemper in horses	Measles whooping-cough typhoid fever diarrhoea and bronchial affections	—	Malarial and typhoid fevers and bowel diseases	Malarial ([illegible]) pernicious and typhoid ([illegible]) fevers diarrhoea and bronchitis	Bronchial troubles and diarrhoea typhoid ([illegible]) and pernicious (1) malarial fevers	Whooping cough and typhoid fever (1)	—	Influenza (worse than ever before) bronchitis and typhoid fever (1)
Stokes — Dr W L McCanless, Danbury	Measles pneumonia and diphtheria (2)	Scarlatina (1) diphtheria and measles	Pneumonia and measles —	Influenza measles, diphtheria (4)	Acute entero colitis measles and diphtheria (1)	—	Typhoid fever	—	—	Measles, diphtheria (3) and typhoid fever (2)	—	Influenza (very extensive)
Swain — Dr R L Davis, Bryson City, after January	Influenza and pneumonia	Influenza (abating) and measles	Measles —	Pneumonia (1) no others to report	No sickness, but a few cases of diarrhoea	—	—	Typhoid fever —	Typhoid fever (few) —	—	Scarlatina ([illegible], mild) and pneumonia ([illegible])	—
Tyrrell — Dr H Alexander, Columbia	Pneumonia in horses and mules	No diseases to report	No diseases to report —	Mumps and typhoid fever (1)	Dysentery and bowel affections	Mumps, typhoid fever (1) hog cholera	—	Typhoid fever pernicious malarial fever (1)		Typhoid fever —	Typhoid fever (2) cholera in hogs	—
Union — Dr W [illegible] Ramsey, Monroe	Influenza catarrhal and typhoid fevers staggers in horses hog cholera	Influenza hog cholera	Influenza and whooping cough —	Influenza and whooping cough	—	Diarrhoea and typhoid fever ([illegible])	Typhoid fever	—	Typhoid fever and diphtheria	Typhoid fever (2) and diphtheria (1)	Typhoid fever and diphtheria	Influenza (mild but extensive)
Vance — Dr A Cheatham, Henderson	Measles whooping cough and typhoid fever	Influenza measles pneumonia whooping-cough	Measles whooping-cough distemper in horses	No diseases to report distemper in horses	Measles whooping-cough and dysentery	Measles, diarrhoea dysentery	Measles typhoid fever and diarrhoea	Nature of diseases not given	Nature of diseases not given	Little sickness. Nature of diseases not given	—	Nature of diseases not given
Wake — Dr James McKee, Raleigh	Measles (extensive) and mumps typhoid fever (1)	Measles and scarlatina ([illegible])	Mumps ([illegible]) measles (abating) scarlatina ([illegible])	Mumps measles (4) scarlatina ([illegible]) and diphtheria (1)	Scarlatina (3)	Diphtheria (3) and typhoid fever ([illegible])	Measles ([illegible]) and typhoid fever	Typhoid fever (3)	No diseases reported	Diphtheria (1) —	Measles ([illegible]) and whooping cough (2)	Influenza (very extensive)
Warren — Dr P J Macon, Warrenton	Influenza pneumonia and catarrhal fevers	Influenza pneumonia and varicella	—	Measles varicella pneumonia	—	Whooping cough dysentery and measles	Measles whooping-cough malarial and typhoid fevers influenza	Whooping-cough malarial and typhoid fevers		—	—	—
Watauga — Dr W B Council, Boone	None reported —	—	—	Measles and whooping cough		Measles and whooping cough	Whooping-cough —	Diphtheria and typhoid fever (both mild)	—	—	—	—
Wayne — Dr W H Cobb Jr, Goldsboro, till April, then Dr John Spicer, Goldsboro	Bronchitis pneumonia influenza catarrhal fever varicella tuberculosis scabies and whooping-cough	Influenza (abating), bronchitis pneumonia and catarrhal fever	Influenza, measles pneumonia varicella	No diseases reported	Dysentery —	Measles whooping-cough and diarrhoea	Malarial fevers —	Pneumonia malarial and typhoid (2) fevers	Malarial fever diphtheria (1) measles (few) hog cholera	A few cases of measles scarlatina and malarial fever hog cholera	Typhoid fever cholera in hogs	Nature of diseases not given
Wilson — Dr Albert Anderson, Wilson	Nature of diseases not given	Influenza bronchitis and pneumonia hog cholera and distemper in horses	Measles, whooping-cough influenza and pneumonia	Influenza pneumonia dysentery and measles hog and chicken cholera	Measles pneumonia intestinal affections hog and chicken cholera	Whooping-cough, typhoid fever (3) malarial fevers and dysentery (severe)	Malarial fevers diarrhoea dysentery and cholera infantum cholera in domestic animals	Malarial and typhoid (2) fevers whooping-cough (1)	Malarial fevers 1 of pernicious and 2 of hemorrhagic	Malarial fevers (mild)	Malarial fevers colds and bronchitis	Influenza (extensive)
Yadkin — Dr T H Harding, Yadkinville	Mumps, whooping-cough pneumonia intermittent and 1 of hemorrhagic malarial fever	—	Pneumonia rheumatism bronchitis measles typhoid fever whooping cough chicken cholera	—		Typhoid fever (extensive) and dysentery	Typhoid fever (extensive) and whooping-cough	—	Typhoid fever (abating) and diphtheria (few and mild)	—	—	—
Yancey — Dr J L Ray, Burnsville	Typhoid fever (1 case)	Influenza —	Influenza distemper in horses	Whooping-cough mumps	Measles whooping-cough	Measles and whooping cough typhoid fever ([illegible])	Measles whooping cough and typhoid fever	Whooping cough ([illegible]) and typhoid fever	Typhoid fever (few) —	Typhoid fever ([illegible]) —	Typhoid fever (5) —	No epidemic; typhoid fever (1)

STATISTICAL TABLES.

Owing to the fact that the number of towns reporting represents a comparatively small portion of our population, and the further fact that the methods employed by some of them are not as complete as they should be, our vital statistics are not as satisfactory as we would like. At the same time they are valuable. By a study of Tables I and II an excellent idea can be obtained of the distribution of the various diseases throughout the State, and of Table III their relative prevalence at different seasons.

An examination of the tables from the towns, which are well scattered, will show the causes of death in the different localities and the annual death-rate. This latter cannot in the case of every town, as intimated above, be regarded as entirely accurate; but inasmuch as the conditions apply equally to both races they can be depended upon to indicate the relative death-rate among our white and colored people. The death-rate among the latter is very much higher than among the former, being in 1891 16 per thousand as against 10 per thousand among the whites. This great discrepancy is doubtless due to several causes, among which may be mentioned the hardships incident to their greater poverty as a class, the disproportionate prevalence of syphilis among them, and perhaps an inherent weakness of constitution, particularly as to the mulattoes.

TABLE III.—Showing the Comparative Prevalence of Disease During the Years 1891 and 1892.

(The top row of figures opposite each disease is for 1891; the bottom for 1892.)

Diseases.	Number of counties reporting, by months.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Bronchitis	11	14	7	5	2	1	--	1	2	2	4	8
	6	7	9	7	1	--	--	--	2		2	4
Catarrhal Fever	8	--	--	--	--	--	--	1	.	3	4	--
	--	--	--	--	--	1	--	--		--	2	4
Cholera (Sporadic)	1	1	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	1	--	--	--	1	--
Cholera (Chickens)	2	1	2	1	3	--	2	2	1	3	3	1
	1	--		--	1	1	1	1	1	--	--	1
Cholera (Hogs)	2	3	1	4	--	6	8	8	8	9	11	4
	2	2	4	5	2	4	3	4	5	4	1	4
Cholera (Morbus)	1	--	--		1	3	2	--	1	--	--	--
	--	--	--	--	1	1	--	--	--	--	--	--
Cholera (Infantum)	--	--	1	--	2	3	4	--	--	1	1	--
	--	--	--	--		2	2	--	1	.	1	-
Croup, membraneous	--	1	1	--	--	--	1	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--	--	--
Diarrhœa	3	--	1	5	17	13	8	6	2	1	--	--
	--	1	4	2	15	14	6	1	3	--	--	--
Diphtheria	8	5	5	4	1	3	--	--	13	11	9	3
	3	2	4	3	2	1	4	6	8	9	9	5
Distemper (Horses)	4	5	7	4	3	--	2	2	2	2	--	4
	2	1	1	1	--		-	--		--	--	--
Dysentery	--	--	1	6	21	21	7	2	1	3	1	--
	--	--	1	5	27	25	5	--	2	--	--	2
Cerebro-spinal Meningitis	1	--	--	--	--	1	--	--	--	--	--	--
	--	--	--	--	--	--	-	--	--	--	-	--
Erysipelas	--	1	--	--	--		--	--	--	--	--	--
	--	1	1	1	--	1	--		--	--	--	1
Glanders	--	--	--		--	--	--	-	-	--	--	--
	--	--	--	1	--	--	--	-	--	-	--	--
Influenza ("La Grippe")	31	37	40	20	5	3	2	--	--	2	11	36
	41	35	17	3	--	1	--	-	--	1	6	9
Jaundice	2	1	--	--		.	--	1	.	--	3	--
	--	--	--	--		--	-	--	--	--	1	--
Malarial Fever	5	6	2		7	12	23	24	23	16	7	--
	1	--	2	3	7	11	15	10	12	9	4	3

TABLE 2. DISEASES PREVAILING IN THE STATE FOR THE YEAR 1892, BY COUNTIES.

The following table is intended to present in a condensed shape for reference the most prevalent diseases occurring in the different counties each month during the two years ending December 31, 1892. The tables are made up from the reports received each month from the Superintendents of Health. Taking any one county, it only requires to follow the line devoted to it to learn the general diseases common at the various seasons in that county: or, for any one month, it is an easy matter to cast the eye down the list of counties and compare the diseases occurring at the same time in different portions of the State.

Counties and Reporters	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Alamance Dr. G. W. Long, Graham	Influenza abating	Influenza and measles	Nature of diseases not given	Measles and whooping cough	Measles, whooping-cough and intestinal troubles	Whooping-cough and intestinal troubles	Whooping-cough, measles, mild typhoid fever and intestinal diseases	Whooping-cough and a few cases of malarial fever.	Malarial fever, whooping cough and measles, all limited	Whooping-cough and some malarial fever	Whooping-cough, pneumonia and diphtheria	Whooping-cough and pneumonia
Alexander Dr. J. B. Watts, Taylorsville	Influenza (with pneumonia), mumps and whooping cough	Influenza, pneumonia, whooping cough and mumps very prevalent	Influenza and pneumonia, mumps and whooping cough	Whooping cough	Measles, whooping-cough and intestinal troubles	Diarrhoeal troubles, typhoid fever (2)	Typhoid fever (5)	Typhoid fever and diphtheria	Diphtheria (1) and typhoid fever (1)	Typhoid fever (1)		No epidemic, no diseases reported
Buncombe Dr. C. E. Hilliard, Asheville				No diseases of special note		Dysentery	Typhoid fever.		Typhoid fever, very mild.	No special diseases	No special diseases	No special diseases
Burke Dr. J. L. Laxton, Morganton	Influenza, bronchitis and pneumonia, distemper in horses	Influenza, varicella, mumps and whooping cough	Whooping cough (2) and typhoid fever (1)	Measles and whooping-cough	A few cases of whooping cough and dysentery	Diarrhea and dysentery (limited), typhoid fever (1)	Whooping-cough (3), typhoid fever (4) and intestinal disorders	Typhoid fever (10)	Dysentery (1), gastritis (1) and typhoid fever (1)	Diphtheria (2), typhoid fever (3), and jaundice	Jaundice and typhoid fever (1)	Chicken cholera.
Caldwell Dr. A. A. Kent, Lenoir	Influenza extensive, measles (4), whooping cough and typhoid fever (3).	Influenza (abating), catarrhal troubles, whooping cough, typhoid fever (1)	Whooping-cough (10) and measles (3)	Measles and whooping cough.	Cholera morbus, dysentery and diarrhoea, all limited		Typhoid fever mild but general (3)	Typhoid fever general but mild	Typhoid fever (15), diphtheria (6) and scarlatina (3).	Pneumonia, whooping cough, scarlatina (2) and typhoid fever (5)	Pneumonia, bronchitis and influenza, typhoid fever (4).	Pneumonia and bronchitis, typhoid fever (2)
Carteret Dr. M. F. Arendell, Morehead City		Influenza and measles	Influenza general, and measles	No diseases specified	No diseases specified; healthy	No diseases specified	Measles		Measles general	No diseases to report	No diseases to report	No diseases to report
Caswell Dr. R. H. Williamson, Yanceyville	Little sickness	Varicella and measles, hog cholera	Varicella, measles and meningitis in children.	Rheumatism, bronchitis and remittent fever	Remittent fever and dysentery	Remittent fever and dysentery	Hydrophobia in dogs	No diseases to report	A few cases of remittent and typho-malarial fevers.	No diseases to report	Diseases not specified	
Catawba Dr. Geo. H. West, Newton	Influenza, typhoid fever (1)	Influenza and whooping cough	Influenza and whooping cough	Whooping cough and typhoid fever	Dysentery, typhoid fever (2) and whooping-cough (1)	Diarrhea and dysentery, typhoid fever (4)	Whooping-cough, typhoid fever (37) and typho-malarial fever (27)	Whooping-cough (4) and typhoid fever (7)	Typhoid fever (9)	Typhoid fever (8)	Whooping-cough (2) and typhoid fever (1)	Whooping-cough (1), typhoid fever (1), influenza.
Chatham Dr. H. T. Chapin, Pittsboro	Influenza extensive, pneumonia and measles	Influenza and pneumonia		Measles	Dysentery	Dysentery				No diseases reported	Little sickness	Little sickness
Cherokee Dr. J. F. Abernathy, Murphy	Influenza, extensive	No more influenza	Pneumonia	Rheumatism and pneumonia	A few cases of dysentery		Typhoid fever, dysentery and bowel diseases general		No sickness	A few cases of influenza	Slight influenza	Pneumonia and typhoid fever (1)
Cleveland Dr. O. P. Gardner, Shelby	Influenza and pneumonia	Influenza and pneumonia	Influenza, pneumonia and measles	Measles	No diseases specified	Dysentery and typhoid fever	Typhoid fever.	Typhoid fever		Typhoid fever (several)	No diseases	Typhoid fever
Columbus Dr. Isaac Jackson, Whiteville	Influenza and mumps	Influenza, mild	Measles	Measles	Diarrhea, mild whooping-cough (1) and intermittent fever (few)	Diarrhea, whooping-cough (2), typhoid and malarial fevers	Whooping-cough (3), typhoid fever (6) and continued fever	Malarial fever limited	Malarial fever limited, typhoid fever (1)	Some malarial fever, typhoid (1), hog cholera	Typhoid fever (4)	Typhoid fever (1) and pneumonia
Cumberland Dr. J. H. Marsh, Fayetteville	Influenza	No diseases given	Nature of diseases not given	Whooping-cough	Nature of diseases not given.		Malarial fever and whooping cough	Nature of diseases not given	Whooping-cough (1)	Diphtheria (1)	Nature of diseases not given	Nature of diseases not given.
Davidson Dr. R. L. Payne, Jr., Lexington	Whooping-cough and varicella			Whooping cough, rotheln and mumps.	Mumps, rotheln and whooping-cough	Whooping-cough				A few cases of diphtheria	No epidemic	Varicella (limited).
Duplin Dr. J. W. Blount, Kenansville.	Influenza more severe than before and often followed by pneumonia, measles	Influenza and measles	Measles extensive	Hog cholera		A few cases of malaria, diarrhea and dysentery	Malarial fever.	Less sickness for August than ever known, hog cholera.	Diphtheria (1), typhoid fever		Whooping cough, diphtheria and influenza	Pneumonia and whooping-cough, hog cholera
Durham Dr. N. M. Johnson, Durham	Influenza	No epidemic, nature of diseases not given	Pneumonia	Nature of diseases not given, healthy.	Dysentery and other bowel troubles	Nature of diseases not given, healthy	Nature of diseases not given.	Nature of diseases not given	Whooping-cough	No epidemics	Whooping cough, malarial fever	Whooping cough and pneumonia.
Edgecombe Dr. Donald Williams, Tarboro	Influenza wide spread and often followed by pneumonia	Influenza with pneumonia and bronchitis	Influenza, bronchitis, pneumonia and measles	Measles complicated with bronchitis and pneumonia severe	Whooping-cough	Whooping cough and diarrhoea.	Whooping cough, general	Whooping cough general	Whooping-cough general	Intermittent and typho-malarial fevers in most sections	Very little sickness	Measles and typho-malarial fever
Franklin Dr. J. S. Foster, Louisburg.	Influenza and pneumonia	Measles extensive, pneumonia few and mild	Measles and whooping cough both extensive	Measles and complications	Measles and a few cases of dysentery	Whooping-cough, dysentery and typhoid fever (2)	Whooping cough and some mild continued fever	Whooping-cough and a few cases of typhoid, here called "simple continued fever"	Only a little malarial fever	Whooping cough, pneumonia and typhoid fever (2)	Diphtheria (1), typhoid fever (2) and pneumonia	Typhoid fever (4)
Granville Dr. Patrick Booth, Oxford	Influenza and pneumonia, whooping-cough.	Typhoid fever (7), membranous sore throat and pneumonia	Measles (10), whooping-cough (1) and typhoid fever (1)	Measles, whooping-cough and typhoid fever (2)	Measles, diarrhoea and dysentery	Measles, diarrhoea and typhoid fever (3)	Whooping cough and typhoid (6)	Whooping cough (20) and typhoid fever (?)	Typhoid fever (2)	No diseases to report	Whooping cough and typhoid fever (1)	No diseases to report
Greene Dr. P. H. Sugg, Snow Hill	Influenza and pneumonia	Influenza, measles and pneumonia	Influenza, pneumonia and measles	Measles and whooping cough	Dysentery and whooping-cough (few).	Dysentery and malarial fever (limited)	Malarial fever	Varicella and a few cases of scabies and malarial fever	Malarial fever and a few cases of typhoid	Malarial fever and a few cases of typhoid	Typho-malarial fever (limited)	Malarial fever, typhoid and malarial fever
Guilford Dr. E. R. Michaux, Greensboro.	Influenza and pneumonia, measles and malaria.		A few cases of malarial fever and pneumonia							Malarial and typho-malarial fevers, pneumonia.	No new cases of fever.	Mumps
Haywood Dr. J. H. Way, Waynesville	Influenza mild in the young, followed by pneumonia in the old, whooping cough	Influenza, measles and whooping cough	Measles, pneumonia and bronchitis	Erysipelas and catarrhal affections					Typhoid fever (5), milk sickness	Typhoid fever (4)	Typhoid fever (3)	Erysipelas, hog cholera
Henderson Dr. E. L. Egerton, Hendersonville	Influenza extensive	Nature of diseases not given, health good	Measles (2)	Pneumonia and typhoid fever (1)	Dysentery (few), and diarrhoea, measles (2) and typhoid fever (1).	Mumps	Typhoid fever (1)	Whooping-cough and typhoid fever (4)	Typhoid fever (?)	Typhoid fever (1)	Whooping cough and typhoid fever (2)	Whooping-cough and influenza
Iredell Dr. W. J. Hill, Statesville	Influenza, bronchitis and pneumonia, measles	Whooping cough	Whooping-cough	Pneumonia (1)	Whooping cough (general) and typhoid fever (in one family)	Typhoid fever (limited) and whooping-cough.	Typhoid fever (4) and some cholera infantum	Some malarial and typhoid fever, tonsillitis and catarrhal troubles	A few cases of typhoid fever, some diarrhoea, tonsillitis and malarial fever		Typhoid fever, pneumonia, sporadic cholera	Typhoid fever, pernicious malarial fever
Jackson	Influenza extensive and severe	Influenza, with pneumonia	Influenza subsided	Nature of diseases not given, healthy	Typhoid fever (1)	No Board of Health						
Johnston Dr. R. J. Noble, Smithfield.		Influenza, bronchitis and pneumonia, measles	Bronchial affections	Measles and pulmonary troubles, hog cholera	Diarrhoea, dysentery and measles (few)	Diarrhoea and dysentery, chicken cholera	Malarial and typhoid (1) fevers and continued fever	A few cases of remittent fever and two of typhoid	Typhoid fever (1) and pernicious malarial fever (1)	Whooping cough (1)	No sickness	No diseases to report
Lenoir Dr. C. R. Woodley, Kinston			Measles and bronchitis	Measles (general), dysentery, bronchitis and influenza	Measles, general, dysentery, bronchitis and malarial fever	Dysentery and typhoid fever (2)	Malarial and typhoid (3) fevers	Some remittent fever	Some bronchitis and mild intermittent fever	Scarlatina (2)	Remittent fever, measles (1), typhoid fever (1), and pneumonia (1)	Bronchitis and varicella
Lincoln Dr. W. L. Crouse, Lincolnton	Influenza and pneumonia, extensive.	Bronchitis and rheumatism	Pneumonia and bronchitis		Dysentery gen'l, whooping-cough (2) and diphtheria (1)	Whooping-cough, dysentery and typhoid fever (all limited)	Typhoid fever and some dysentery	Typhoid fever and whooping-cough	Typhoid fever, mostly old cases		Whooping cough (4), typhoid fever (6)	Typhoid fever (6), pneumonia
Macon Dr. S. H. Lyle, Franklin	No diseases to report	A few cases of influenza	No diseases reported	Diphtheria (2) and typhoid (3)	Typhoid fever (1)	Typhoid fever (1)	Typhoid fever (1)					Influenza, pneumonia
Martin Dr. W. H. Harrell, Williamston		Bronchitis and pneumonia		Measles	Measles and enteric troubles, general, typhoid fever (4)	A few cases of malarial fever, diarrhoea, dysentery, measles and whooping cough					Typhoid fever (5), hemorrhagic malarial fever (2).	Typhoid fever (5), bronchitis, dysentery
McDowell Dr. B. A. Cheek, Marion	Influenza extensive and severe	Influenza, bronchitis and pneumonia	Influenza and pneumonia	Bronchitis and pneumonia	Pneumonia, diarrhoea and dysentery				Typhoid fever (8)	Typhoid fever (20), mild, some diphtheria and whooping-cough	No new cases of fever	Typhoid fever (2)
Mitchell Dr. C. E. Smith, Bakersville	Influenza and measles	Influenza very extensive, measles	Influenza	Whooping-cough (severe) and typhoid fever (1).	Whooping cough general but less severe	Epidemic of influenza, whooping-cough.	Diarrhoea and cholera infantum, typhoid fever (1)		Whooping cough, typhoid fever (?), some bronchitis and pneumonia.	Whooping cough and typhoid fever (3)		
Montgomery Dr. I. E. Asbury, Asbury.		Influenza and measles both extensive, whooping cough, diphtheria	Influenza, measles and scarlatina (?)	Measles, whooping-cough, scarlatina and diphtheria (1), hog cholera	Whooping cough (5) and scarlatina (6).	Dysentery, measles, scarlatina (5), typhoid fever (5) and malarial fever, hog cholera	Whooping cough and typhoid fever (?)	Measles, whooping-cough, typhoid fever (3) and pernicious malarial fever (?)	Measles, whooping cough, diphtheria, typhoid fever and hemorrhagic-malarial fever		Influenza, whooping cough, scarlatina, diphtheria, and typhoid and malarial fevers	Influenza, measles, whooping cough, scarlatina, diphtheria and malarial fever
Moore Dr. Gilbert McLeod, Carthage.							Gastro intestinal troubles less than usual, typhoid fever (4)	Little sickness	Whooping-cough and typhoid fever (7)		Whooping-cough	
Nash Dr. J. J. Mann, Nashville	Influenza, measles and typhoid fever (5)	Influenza, bronchitis, pneumonia and measles, distemper in dogs	Measles, whooping-cough and pneumonia, diphtheria (1)	Whooping-cough and dysentery both extensive		Typho-malarial fever	Whooping-cough		Whooping-cough and typhoid fever (10)	Continued fever in all parts, typhoid fever (10), hog cholera	Typhoid fever (5)	
New Hanover Dr. I. W. Potter, Wilmington	Influenza, whooping-cough, measles (5), diphtheria (1) and typhoid fever (2)	Influenza (abating), measles, whooping cough and typhoid fever (1)	Measles, whooping-cough, diphtheria (6), and typhoid fever (2), influenza, distemper.	Measles, rotheln, whooping cough, diphtheria (1) and typhoid fever (1)	Measles and whooping-cough general, typhoid fever (6) and scarlatina and hemorrhagic malarial fever (1 each)	Measles, whooping-cough, scarlatina (?) and typhoid fever	Measles (4), whooping cough (20), diphtheria (2), pernicious malarial (2) and typhoid (15) fevers	Diarrhoea, some malaria, one or two of measles, whooping-cough, diphtheria, pernicious and hemorrhagic malarial fever, typhoid (12)	Measles, whooping cough (?), diphtheria (?), typhoid (?), pernicious (1) and hemorrhagic (1) malarial fevers	Typhoid (5), and one each of hemorrhagic and pernicious malarial fever and diphtheria	Diphtheria (1), typhoid fever (1)	Measles (1), pernicious malarial fever (1) and influenza
Northampton Dr. H. W. Lewis, Jackson					Epidemic of dysentery, mild		Measles and whooping-cough, typhoid (12) and pernicious malarial (1) fevers			Malarial, typhoid (2) and hemorrhagic malarial (2) fevers and diphtheria (4)	Influenza, diphtheria (1), typhoid fever (5) and hemorrhagic malarial fever	Diphtheria (6), typhoid fever (1) and influenza
Onslow Dr. L. L. Cox, Jacksonville	Influenza extensive, pneumonia, measles		Influenza, remittent fever.			Dysentery, hog cholera	Malarial and typhoid (2) fevers, hog cholera				Diphtheria (2)	
Orange Dr. D. C. Parris, Hillsboro	Influenza and pneumonia, rather severe	Influenza and rheumatism	Bronchitis, tonsillitis and rheumatism	Measles and catarrhal diseases	Diarrhoeal diseases, general, a few cases of measles and pneumonia	Intestinal diseases, typhoid fever (1)	Bowel and pulmonary diseases, two each of scarlatina, typhoid fever and sporadic cholera		Some influenza and tonsillitis, mild, whooping cough, a few cases of pernicious and hemorrhagic malarial fever		Whooping-cough and typhoid fever (1)	Remittent fever
Pender Dr. S. S. Satchwell, Burgaw	Influenza extensive, and pneumonia	Influenza and pneumonia, cholera in hogs	Influenza, hog cholera	Influenza, limited	Bowel diseases	No diseases given; healthy	Malarial and typhoid fevers	Malarial and typhoid fevers	Much typhoid fever			
Pitt Dr. H. F. Cox, Kedalia	Influenza and measles, with bronchitis a sequel to both	Influenza and measles, both extensive	Influenza and measles, hog cholera		Diarrhoea, dysentery and intermittent fever, a few cases of measles, whooping cough and varicella		Malarial and typhoid fevers and intestinal troubles		Malarial and typhoid fevers in all parts, bronchitis and whooping-cough	Malarial and typhoid fevers, pernicious (2) and hemorrhagic-malarial (1) fevers	Pneumonia (1), hemorrhagic malarial fever, whooping-cough	Influenza (limited)
Randolph Dr. J. M. Boyette, Asheboro	Influenza, measles (3), whooping cough (?) and typhoid fever (1)	Measles (6), whooping cough (1), diphtheria (2) and typhoid fever (2)	Measles and typhoid fever (4), hog cholera, distemper in horses	Measles (1) and typhoid fever (1), distemper in horses and cholera in hogs and chickens.	Dysentery, general, pneumonia, measles and whooping cough, distemper and pink eye in horses	Measles (1), whooping-cough and typhoid fever (2), hog cholera, dysentery	Measles (4), whooping cough (7) and typhoid fever (?)	Whooping cough and typhoid fever (12), cholera in hogs and chickens	Whooping-cough, pneumonia, diarrhoea, dysentery, malarial and typhoid (4) fevers	Whooping cough, scarlatina (1), and typhoid fever (?)	Scarlatina (1) and typhoid fever (?)	Whooping-cough, typhoid fever (4) and influenza
Richmond Dr. J. M. Stansill, Rockingham	Influenza, extensive, in small per cent complicated with bronchitis and pneumonia	Influenza extensive, measles		Measles (mild) and dysentery	Measles, whooping-cough (4), and diphtheria (1)	Dysentery and typho-malarial fever, typhoid fever (?)	A few cases of malarial fever, diphtheria and typhoid fever, scarlatina (1)	Whooping cough, scarlatina and diphtheria (1 each), typhoid fever (4).	Diphtheria (4) and two each of scarlatina, whooping-cough and typhoid fever	Diphtheria (1) and typhoid fever (2)	Whooping cough and diphtheria (4)	Whooping cough, diphtheria (1) and typhoid fever (1).
Robeson Dr. R. F. Lewis, Lumberton	Influenza and measles	Influenza with pneumonia, often measles	Little sickness, nature of diseases not given	Little sickness, nature not given	Measles, whooping-cough and typhoid fever, limited	Whooping cough, malarial fever and bowel troubles.	Whooping cough, hog cholera	Whooping-cough	Whooping-cough and malarial fever, cholera in hogs	Some whooping-cough	Scarlatina and whooping-cough, hog cholera	Some whooping cough, scarlatina and diphtheria
Rowan Dr. J. J. Summerell, Salisbury	Influenza mild, bronchitis and pneumonia less than usual for the season	Influenza, bronchitis and pneumonia, measles and whooping-cough	A little influenza, bronchitis and pneumonia	No sickness	No diseases except mild diarrhoea and dysentery	Whooping-cough and typhoid fever	Malarial and typhoid fevers	Typhoid and malarial fevers, diphtheria (1)	Diphtheria (1) and some mild malarial fever	Diphtheria (2), typhoid (3), malarial and pernicious malarial (1) fevers	Typhoid fever (4)	Typhoid fever (few)
Rutherford Dr. W. A. Thompson, Cliffdale		Influenza, measles and whooping cough.	Health improved, nature of diseases not given.			Dysentery and entero-colitis	Health good, no diseases specified	A few cases of typhoid fever		Whooping-cough, typhoid and scarlet fevers	Whooping-cough, typhoid fever (1)	No diseases to report
Sampson Dr. John A. Stevens, Clinton	Influenza, bronchitis and pneumonia, tonsillitis, varicella and whooping-cough, hog cholera and distemper		Influenza, pneumonia, bronchitis, whooping cough and measles	Influenza, measles, whooping-cough, bronchitis, pneumonia, dysentery and malarial fever, hog cholera	Some whooping-cough, measles, pneumonia, diarrhoea, dysentery and malarial fever, typhoid fever (1), hog cholera and hydrophobia (2)	Measles, whooping cough, malarial and typhoid fevers		Measles, whooping-cough, malarial fever, typhoid fever very prevalent		Whooping-cough and a few of typhoid and malarial fevers	Whooping cough and a few of typhoid and malarial fevers	Pneumonia, bronchitis and influenza.
Stokes Dr. J. W. Neal, Meadows	Measles, diphtheria and typhoid fever.	Measles	Pneumonia, measles (3), diphtheria (2)	Whooping-cough	Some mild dysentery	Whooping cough, diphtheria (2) and typhoid fever (4)	Whooping cough, diphtheria (1) and typhoid fever	Whooping-cough and diphtheria (?)	Whooping cough, diphtheria (23) and typhoid fever (15)	Whooping cough, diphtheria (4) and typhoid fever (15)	Diphtheria (6) and typhoid fever (12)	Diphtheria (4) and typhoid fever (6)
Swain Dr. B. I. Davis, Bryson City	Influenza limited and mild, nothing else	Influenza limited and mild						Gastritis		Capillary bronchitis (1)	No diseases to report	No sickness
Tyrrell Dr. Alf. Alexander, Columbia	Influenza, half the people sick with it in last two months, diphtheria (2) and typhoid fever (1)	Pernicious malarial fever (1)				Measles, cholera infantum and typhoid fever (1)				Typhoid (4), pernicious (1) and hemorrhagic (1) malarial fevers.		
Union Dr. W. C. Ramsey, Monroe		Influenza and tonsillitis	Measles, pneumonia and catarrhal affections		Dysentery and diarrhoea	Malarial fever and diarrhoea	Whooping cough, malarial, typhoid and typho-malarial fevers	Whooping-cough subsiding, malarial fever, scarlatina (1) and diphtheria (1)	Whooping-cough, diphtheria (?) and typhoid fever (5)			
Vance Dr. A. Cheatham, Henderson	Nature of diseases not given	Nature of diseases not given	Health good, nature of diseases not given.	Nature of diseases not given	Nature of diseases not given	Diseases not given	Nature of diseases not given	Nature of diseases not given		Nature of diseases not given	Health unusually good	Diseases not given
Wake Dr. James McKee, Raleigh	Influenza abating, whooping-cough (6)	Influenza, nearly subsided	Scarlatina (1), and diphtheria (1)	No epidemic, two cases of glanders in horses	Varicella (3), typhoid fever (1)	Typhoid fever.	Scarlatina (1), diphtheria (2) and typhoid fever (19).	Typhoid fever (7)	Whooping-cough (1) and typhoid fever (4)	Typhoid fever (4)	Diphtheria (2)	Scarlatina (1) and typhoid fever (1)
Watauga Dr. W. B. Councill, Boone			Influenza		Scarlatina (16) and typhoid fever (2), influenza general	Scarlatina, whooping-cough and typhoid fever (1)	Whooping-cough (10), scarlatina (1) and typhoid fever (1)	Scarlatina in all parts, mild, typhoid fever (2)	Scarlatina (10) very mild		No diseases to report	
Wayne Dr. John Spicer, Goldsboro	Measles, whooping-cough and influenza	Measles epidemic, some pneumonia and fever	Measles, not so extensive, pneumonia, bronchitis and whooping-cough	Measles and whooping-cough both few		Measles, whooping-cough, malarial fever, hog cholera	Cholera in hogs and chickens	Whooping-cough, cholera in hogs				Pneumonia.
Wilson Dr. Albert Anderson, Wilson	Influenza and pneumonia, measles and whooping cough (1).	Influenza, pneumonia and measles	Measles extensive and whooping-cough.	Measles, bronchitis and pneumonia	Whooping cough, measles, malarial and dysentery	Dysentery, diarrhoea and malarial fever	Malarial fevers	Whooping cough, typhoid fever (5 or 6).	Malarial fevers in all parts, a few of whooping-cough and several of typhoid fever.	Malarial and pernicious malarial (3) fevers	Typhoid, malarial and pernicious malarial fevers, pneumonia, cholera infantum	Dysentery, pneumonia and malarial fever
Yancey Dr. J. L. Ray, Burnsville	Influenza	Influenza	Influenza	No diseases of importance	No diseases to report	Typhoid fever (3)	Typhoid fever (4)	Typhoid fever (5)	Typhoid fever (3), diarrhoea, cholera infantum and pneumonia	Typhoid fever (1)	Whooping-cough and typhoid fever (1)	Whooping-cough and typhoid fever (1)

COLUMBIA UNIVERSITY LIBRARY

TABLE III.—COMPARATIVE PREVALENCE OF DISEASE—*Continued.*

(The top row of figures opposite each disease is for 1891; the bottom for 1892.)

DISEASES.	NUMBER OF COUNTIES REPORTING, BY MONTHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Malarial Fever, hæmorrhagic	4	3	2	6	1	--	1	5	4	1	3	--
	--	--	--		1	1		1	3	3	4	--
Malarial Fever, pernicious	1	--	1	--	2	2	1	5	5	1	--	1
	--	1	--	--	--	1	2	2	2	5	2	2
Measles	15	26	34	29	26	21	11	5	7	9	5	4
	16	22	28	22	17	9	5	4	3	.	--	3
Meningitis	2	2		--	--	--	--	--	--	1	--	.
		1	--	--	--	--	--	1	--	--	--	--
Milk Sickness	--		--	--	--		--		.	--	--	--
	--		--		--	--	--	--	1	--	--	--
Mumps	4	3	7	5	1	2	--	--	--	--	1	1
	2	2	1	1	1	1	--	--	--	--	--	1
Pneumonia	21	24	26	13	5	--	2	2	1	3	8	12
	20	17	18	9	4	--	--	.	2	3	6	14
Pink Eye (horses)	--	--	--	1	--	1	1	1	--	--	--	--
	--	--	--	--	.	--	--	--	--	--	--	--
Rabies		--	1	1	--	--	--	--	--	--	--	--
		--	--	--	.	.	1	--	--	--	--	--
Rheumatism	3	3	4	4	2	.	1	--	--	--	1	2
	--	2	--	3	--	1	.	--	--	--	--	--
Rotheln	--	--	--		--	--	--	--	--	--	--	--
	--	.	--	2	1	--	--	--	--	--	--	--
Scarlatina	1	6	6	2	3	1	--	1	2	2	2	--
	--	--	2	1	4	3	4	4	2	4	2	3
Small-Pox	--	--	1	--	--	--	--	--	.	--	--	--
	--	--	--	--	--	--	--	--	--	--	--	--
Staggers (horses)	2	1	2	1	.	--	--	1	4	--	--	--
	--	--	--	--	--	--	--	--	1	1	--	--
Tonsillitis	1	2	--	1	--	--	1	2	3	2	5	--
	1	1	1	1	--	--	--	2	5	--	--	--
Typhoid Fever	19	6	10	7	13	27	34	38	38	32	20	10
	7	5	5	7	10	22	34	23	25	25	24	16
Typho-Malarial Fever	--	--	--	--	1	1	3	--	3	3	--	--
	--	--	.		--	2	2	--	1	3	1	1
Varicella	2	2	3	--	1	--	--	--	--	--	1	1
	1	2	1	1	2	--	--	1	--	--	--	--
Whooping-Cough	10	9	17	--	11	16	12	12	12	14	10	9
	11	12	12	16	18	17	16	16	16	12	15	9

TABLE No. IV.—TABLE OF MORTUARY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1891.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1891.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1891.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Asheville Dr. H. B. Weaver	W	12	a	7	a	a	a	a	6	4	a	a	a	29	51 4 mos.	20.6	a	12.0	a	a	a	a	8.0	6.8	a	a	a	----	----	9,000	12,000
	C	6		6					7	3				22		24.0		24.0					28.0	12.0				----	----	3,000	
Charlotte	W	11	6	14	a	a	a	a	a	a	a	a	a	31	72 3 mos.	18.9	10.3	24.0	a	a	a	a	a	a	a	a	a	----	----	7,000	13,000
	C	11	10	20										41		22.0	20.0	40.0										----	----	6,000	
Durham Dr. N. M. Johnson	W	a	2	3	1	2	4	5	4	5	0	2	2	30	56 11 mos.	a	6.0	9.0	3.0	6.0	10.0	13.3	12.0	15.0	0 0	6.0	5.3	7.3	8.1	4,500	7,500
	C		2	3	3	1	2	3	4	2	3	1	2	26			8.0	12.0	10.3	3.4	8.0	12.0	16.0	6.8	12.0	4.0	8.0	9.4		3,000	
Fayetteville Dr. J. H. Marsh	W	2	4	2	3	6	9	8	6	6	3	3	4	56	112	8.6	17.1	8.6	12.8	25.7	38.6	34.3	25.0	25.7	12.8	12.8	17.1	20. 0	22.4	2,800	5,000
	C	3	5	4	5	4	5	7	7	1	4	7	4	56		16.4	27.2	21.8	27.2	21.8	27.2	38.2	38.2	5.4	21.8	38.2	21.7	25.4		2,200	
Greensboro Dr. E. R. Michaux	W	a	1	3	3	3	2	1	1	a	a	4	a	18	28 8 mos.	a	3.0	9.0	9.0	9.0	6.0	3.0	3.0	a	a	12.0	a	6.7	7.0	4,000	6,000
	C		1	1	1	1	1	1	2			2		10			6.0	6.0	6.0	6.0	6.0	6.0	12.0			12.0		7.5		2,000	
Goldsboro Dr. W. H. Cobb, Jr. Dr. John Spicer	W	2	2	0	1	2	3	3	8	1	2	4	2	30	51	9.6	9.6	0.0	4.3	8.6	12.9	12.8	34.3	4.4	8.6	17.2	8.5	10.7	10.2	2,800	5,000
	C	2	1	3	4	0	3	1	0	1	3	1	2	21		9.6	4.8	14.4	21.8	0.0	16.4	5.5	0.0	5.2	15.9	5.5	10.8	9.5		2,200	
Henderson Dr. A. Cheatham	W	2	0	0	0	3	2	a	0	1	0	a	2	10	54 10 mos.	10.6	0.0	0.0	0.0	15.1	10 6	a	0.0	5.3	0.0	a	12.0	5.3	15.2	2,256	4,256
	C	1	3	5	4	6	8		6	4	3		4	44		6.0	18.0	30.0	24.0	36.0	48.0		36.0	24.0	18.0		21.2	18.0		2,000	
Hillsboro Dr. D. C. Parris	W	1	0	1	a	0	1	4	1	2	0	1	a	11	30 10 mos.	20 0	0.0	24.0	a	0.0	20.0	80.0	20.0	a	0.0	20.0	a	22.0	36.0	600	1,000
	C	2	3	4		1	0	4	3	1	1	0		19		60.0	90.0	12.0		30.0	0.0	20.0	90.0		36.0	0.0		56.1		400	
Oxford Dr. J. M. Hayes Dr. P. Booth	W	a	1	2	1	3	0	a	a	1	2	2	4	16	42 9 mos.	a	7.5	15.0	6.0	21.2	0.0	a	a	7.1	16.0	14.1	28.2	12.6	16.9	1,700	3,300
	C		4	3	4	5	1			2	3	1	3	26			28.2	21.0	32.0	37.5	7.5			15.0	24.0	7.5	22.5	21.7		1,600	
Raleigh Dr. James McKee	W	7	a	11	9	15	23	15	9	5	5	9	12	120	253 11 mos.	10.5	a	16.5	13.5	22.5	35.7	22.5	13.5	7.5	7.5	13.5	18.0	16.3	18.4	8,000	15,000
	C	14		11	12	13	13	17	15	3	13	9	13	133		24.0		18.9	20.6	22.3	22.3	29.1	25.7	5.1	22.3	15.4	22.3	20.7		7,000	

TABLE No. IV.—TABLE OF MORTUARY REPORTS, ETC.—*Continued.*

TOWNS AND REPORTERS.	Race.	DEATHS BY MONTHS—1891.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1891.														POPULATION	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Salisbury	W	5	4	6	1	2	6	4	3	3	2	5	3	44	81	21.4	17.4	25.7	4.2	8.6	25.2	16.8	10.2	10.3	7.0	21.1	12.6	15.4	18.0	2,850	4,500
Dr. J. J. Summerell	C	0	3	3	4	2	5	4	3	4	2	6	1	37		0.0	20.5	25.7	29.0	14.1	36.3	29.1	29.9	26.6	12.6	43.6	7.3	23.0		1,650	
Statesville	W	3	5	1	2	1	1	1	1	2	4	2	2	25	30	18.0	34.7	6.0	12.0	6.0	6.0	6.0	6.0	12.0	24.0	12.0	12.0	12.5	12.0	2,000	2,500
Dr. M. W. Hill	C	0	0	0	1	0	0	1	0	1	0	2	0	5		0.0	0.0	0.0	24.0	0.0	0.0	24.0	0.0	24.0	0.0	48.0	0.0	10.0		500	
Tarboro	W	1	0	1	0	4	0	2	3	0	2	0	1	14	35	9.5	0.0	9.5	0.0	38.1	0.0	19.1	28.6	0.0	19.1	0.0	9.5	10.9	14.8	1,258	2 370
Dr. D. Williams	C	3	2	0	1	2	2	3	1	2	1	1	3	21		32.3	21.5	0.0	10.8	21.6	21.6	32.3	10.8	21.6	10.8	10.8	32.4	18.9		1,112	
Warrenton	W	0	0	*a*	1	*a*	0	*a*	1	*a*	*a*	*a*	*a*	2	4 3 mos.	0.0	0.0	*a*	11.4	*a*	0.0	*a*	11.4	*a*	*a*	*a*	*a*	----	----	1,050	3,000
Dr. P. J. Macon	C	0	0		0		1		1					2		0.0	0.0		0.0		12.6		12.6					----	----	1,950	
Wilmington	W	11	12	10	10	13	15	15	11	7	7	14	14	139	440	14.7	16.0	13.3	13.3	17.3	20 0	20.0	14.7	9.3	9.3	18.7	18.7	15.4	20.9	9,000	21,000
Dr. F. W. Potter	C	21	23	26	24	22	32	24	30	29	29	19	22	301		21.0	23.0	26.0	24.0	22.0	32.0	24.0	30.0	29.0	29.0	19.0	22.0	25.1		12,000	
Wilson	W	5	2	0	1	4	2	3	4	2	3	2	6	34	55	30.0	30.0	0.0	6.0	24.0	12.0	18.0	24.0	12.0	18.0	12.0	36.0	17.0	15.7	2,000	3,500
Dr. A. Anderson	C	3	0	1	0	0	4	4	5	1	0	2	1	21		24.0	24 0	8.0	0.0	0.0	32.0	32.0	40.0	8.0	0.0	16.0	8.0	14.0		1,500	

TABLE V.—TABLE OF MORTUARY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1892.

TOWNS AND REPORTERS.	Race.	DEATHS BY MONTHS—1892.														DEATH-RATE (ANNUAL) PER 1000 BY MONTHS—1892.														POPULAT'N.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Asheville	W	a	a	a	9	8	9	7	a	19	12	14	10	88	141	a	a	a	14.4	12.8	14.4	11.2	a	30.4	19.2	19.2	16.0	17.6	20.2	7,500	10,500
Dr. C. E. Hilliard	C				8	6	4	9		5	6	11	4	53					32.0	24.0	16.0	36.0		20.0	24.0	28.0	16.0	26.5		3,000	
Charlotte	W	a	a	a	a	a	a	13	a	8	6	8	8	43	100	a	a	a	a	a	a	26.0	a	16.0	9.0	10.5	12.0	12.9	17.1	8,000	14,000
City Clerk	C							18		9	8	13	9	57								43.2		21.6	16.0	24.0	18.0	22.8		6,000	
Durham	W	1	3	5	4	7	3	6	8	7	4	4	4	56	98	2.7	8.0	13.3	10.6	18.7	8.0	16.0	21.3	18.6	9.6	8.0	10.7	11.2	12.2	5,000	8,000
Dr. N. M. Johnson	C	2	3	3	5	3	2	5	3	5	4	3	4	42		8.0	10.3	10.3	17.1	10.3	6.8	17.1	20.0	17.1	16.0	10.3	17.7	14.0		3,000	
Fayetteville	W	3	2	3	1	3	5	3	3	1	4	3	0	31	89	12.8	8.4	12.8	4.3	12.9	21.4	12.8	12.8	4.3	16.1	12.9	0.0	11.1	17.8	2,800	5,000
Dr. J. H. Marsh	C	9	6	5	4	5	6	6	4	5	4	4	0	58		49.1	32.7	27.3	21.8	27.3	32.7	32.7	21.8	27.3	21.8	21.8	0.0	26.4		2,200	
Greensboro	W	3	a	2	a	a	a	a	a	a	2	2	1	10	18	9.0	a	6.0	a	a	a	a	a	a	6.0	6.0	3.0	6.0	8.6	4,000	6,000
Dr. E. R. Michaux	C	3		0							2	2	1	8		18.0		0.0							12.0	12.0	6.0	9.6		2,000	
Goldsboro	W	7	3	6	1	7	6	5	7	5	5	4	5	61	113	30.0	12.8	18.9	4.3	30.0	25.7	21.5	30.0	21.4	21.0	17.1	21.7	21.8	22.6	2,800	5,000
Mayor Hollowell	C	6	1	4	2	4	4	4	5	9	5	4	4	52		32.5	5.4	16.0	10.9	21.8	21.8	21.8	27.3	49.1	27.3	21.8	21.8	23.6		2,200	
Henderson	W	0	2	a	1	3	3	0	4	a	0	0	0	13	62	0.0	12.0	a	5.3	15.9	15.9	0.0	21.3	a	0.0	0.0	0.0	6.9	17.5	2,256	4,256
Dr. A. Cheatham	C	3	0		10	5	7	7	6		8	3	0	49		18.0	0.0		60.0	30.0	42.0	42.0	36.0		48.0	18.0	0.0	29.4		2,000	
Hillsboro	W	0	0	0	a	1	2	0	3	0	a	1	0	7	23	0.0	0.0	a	0.0	10.0	40.0	0.0	30.0	0.0	a	20.0	0.0	14.0	28.6	600	1,000
Dr. D. C. Parris	C	2	2	1		0	3	3	4	0		0	1	16		60.0	60.0		30.0	0.0	90.0	90.0	60.0	0.0		0.0	30.0	48.0		400	
Marion	W	n	o	t	b	e	g	u	n	0	3	0	0	3	5	----	----	----	----	----	----	----	----	0.0	55.4	0.0	0.0	----	----	650	800
Dr. B. A. Cheek	C									0	1	0	1	2										0.0	80.0	0.0	80.0			150	
Monroe	W	a	a	a	2	3	3	a	a	a	a	a	a	8	18	a	a	a	20.0	30.0	30.0	a	a	a	a	a	a	----	----	1,200	2,000
Dr. W. D. Pemberton	C				3	2	5							10					45.0	30.0	75.0									800	
Morehead City	W	n	o	t ..	b	e	g	u	n		3	2	0	5	7	----	----	----	----	----	----	----	----	----	34.1	21.7	0.0	----	----	1,059	1,254
Mayor Perry	C										1	1	0	2											25.8	61.5	0.0			195	

TABLE V.—TABLE OF MORTUARY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1892.—*Continued.*

TOWNS AND REPORTERS.	Race.	DEATHS BY MONTHS—1892.														DEATH-RATE (ANNUAL) PER 1000 BY MONTHS—1892.														POPULAT'N.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Oxford	W	0	4	1	3	0	2	1	2	0	0	1	1	16	63	0.0	28.2	7.1	21.2	0.0	14.1	7.0	14.1	0.0	0.0	7.1	7.0	9.4	19.1	1,700	3,300
Dr. P. Booth	C	0	1	6	4	4	10	6	4	2	3	3	4	47		0.0	7.5	45.0	30.0	30.0	75.0	45.0	30.0	15.0	22.5	7.5	30.0	29.4		1,600	
Raleigh	W	11	8	9	6	11	15	25	15	9	12	13	10	144	323	16.5	21.0	13.5	9.0	16.5	22.5	37.5	22.5	13.5	18.0	16.5	15.0	18.0	21.5	8,000	15,000
Dr. James McKee	C	10	13	10	9	19	24	22	15	12	15	14	16	179		17.1	22.3	17.1	15.4	32.6	41.1	37.7	25.7	20.6	25.7	20.6	27.0	29.2		7,000	
Rockingham	W	*a*	*a*	*a*	*a*	2	1	1	0	0	0	2	0	6	8	*a*	*a*	*a*	*a*	30.0	15.0	12.0	0.0	0.0	0.0	20.0	0.0	9.0	7.1	1,000	1,700
Dr. J. M. Stansill	C					0	0	0	0	0	1	1	0	2						0.0	0.0	0.0	0.0	0.0	17.1	30.0	0.0	4.3		700	
Rocky Mount	W	2	2	0	1	2	*a*	0	*a*	0	0	2	1	10	15	40.0	40.0	0.0	15.0	30.0	*a*	0.0	*a*	0.0	0.0	30.0	15.0	15.0	15.0	800	1,200
Dr. Geo. Wimberly	C	1	1	0	0	1		1		1	0	0	0	5		30.0	30.0	0.0	0.0	30.0		30.0		3.0	0.0	0.0	0.0	15.0		400	
Salem	W	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	3	1	0	4	4	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	9.1	3.0	0.0	....	....	3,942	4,284
Chm. Bd. of Health	C										0	0	0	0											0.0	0.0	0.0			342	
Salisbury	W	2	3	4	0	4	5	4	4	2	5	2	0	35	71	8.4	10.3	16.9	0.0	12.6	21.0	16.9	16.0	8.0	20.0	8.0	0.0	11.7	14.2	3,000	5,000
Dr. J. J. Summerell	C	14	1	1	4	0	2	3	3	0	2	2	4	36		101.8	6.0	7.3	29.1	0.0	14.5	21.8	18.0	0.0	12.0	12.0	24.0	18.0		2,000	
Scotland Neck	W	0	1	1	2	1	1	0	2	0	0	1	0	9	17	0.0	20.0	15.0	30.0	15.0	15.0	0.0	34.3	0.0	0.0	17.1	0.0	12.9	15.4	700	1,100
	C	2	1	1	0	0	0	1	2	0	0	0	0	8		60.0	30.0	34.3	0.0	0.0	0.0	24.0	60.0	0.0	0.0	0.0	0.0	20.0		400	
Southport	W	1	0	0	3	*a*	*a*	*a*	*a*	0	*a*	0	0	4	10	30.0	0.0	0.0	90.0	*a*	*a*	*a*	*a*	0.0	*a*	0.0	0.0	17.6	17.2	400	1,000
	C	0	0	0	1					3		2	0	6		0.0	0.0	0.0	20.0					50.0		40.0	0.0	17.1		600	
Statesville	W	1	3	0	1	3	3	3	2	*a*	*a*	*a*	4	20	21	6.0	18.0	0.0	6.0	18.0	18.0	18.0	12.0	*a*	*a*	*a*	24.0	13.2	7.0	2,000	2,500
Dr. W. J. Hill	C	0	1	0	0	0	0	0	0				0	1		0.0	24.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	2.6		500	
Tarboro	W	2	1	5	1	4	5	3	1	2	2	1	4	31	53	19.1	12.0	47.7	9.5	38.1	47.7	32.7	9.5	19.1	19.1	9.5	38.2	25.4	....	1,258	2,370
Dr. D. Williams	C	0	4	1	4	1	2	1	1	1	1	2	4	22		0.0	40.0	10.8	43.1	10.8	21.6	13.3	10.8	10.8	10.8	21.6	43.2	19.8		1,112	
Washington	W	*a*	2	3	1	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	6	18	*a*	8.6	18.0	6.0	*a*	*a*	*a*	*a*	*a*	*a*	*a*	*a*	....	....	2,800	4,600
	C		2	6	4									12			13.3	45.0	30.0											1,800	

TABLE V.—TABLE OF MORTUARY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1892.—*Continued.*

TOWNS AND REPORTERS.	Race.	DEATHS BY MONTHS—1892.														DEATH RATE (ANNUAL) PER 1000 BY MONTHS—1892.														POPULAT'N.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Weldon	W	1	3	0	1	0	2	0	1	1	1	1	0	11	28	17.5	52.5	0.0	17.5	0.0	35.0	0.0	17.5	17.5	17.5	17.1	0.0	16.0	19.5	685	1,435
Mayor Gooch	C	1	3	1	0	1	2	4	3	0	1	0	1	17		16.0	48.0	16.0	0.0	16.0	32.0	64.0	48.0	0.0	16.0	0.0	16.0	24.0		750	
Wilmington	W	17	11	15	15	15	13	23	14	6	9	10	11	159	436	22.7	14.7	20.0	20.0	20.0	17.3	30.7	18.7	8.0	10.8	9.6	13.2	15.9	19.8	10,000	22,000
Dr. F. W. Potter	C	26	23	25	28	18	18	21	23	28	29	19	19	277		26.0	23.0	25.0	28.0	28.0	18.0	21.0	23.0	28.0	29.0	14.0	19.0	23.1		12,000	
Wilson	W	3	4	4	1	2	2	4	1	3	4	2	1	31	70	18.0	24.0	24.0	6.0	12.0	12.0	21.0	6 0	18.0	24.0	12.0	6.0	15.5	20.0	2,000	3,500
Dr. A. Anderson	C	0	8	4	3	1	2	5	3	4	3	3	3	39		0.0	64.0	32.0	24.0	8.0	16.0	40.0	21.0	32.0	24.0	24.0	24.0	26.0		1,500	
Winston	W	4	4	*a*	*a*	*a*	*a*	5	*a*	*a*	*a*		*a*	13	69	9.8	10.0	*a*	*a*	*a*	*a*	11.7	*a*	*a*	*a*	*a*	*a*	....	....	------	------
	C	14	5					37						56		32.9	11.5					90.6									

TABLE VI.—SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1891.

TOWNS.	RACES.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All other Diseases.	Accident and Violence.	Suicide.	Still-born.	TOTAL DEATHS.		Deaths under Five Years.	REMARKS.
																		By Races.	By Towns.		
Asheville	White	2	0	0	0	0	1	2	5	2	2	2	4	7	1	1	0	29	51	25	For four months—January, March, August and September.
	Colored	1	0	0	0	1	1	1	2	0	1	1	2	11	1	0	0	22			
Charlotte......	White	0	0	0	0	0	2	2	1	1	2	0	2	15	2	0	5	32	72	28	For three months—January, February and March.
	Colored	1	0	0	0	1	0	2	12	1	1	0	2	13	2	0	5	40			
Durham	White	1	0	0	0	0	0	2	4	0	3	0	7	7	0	0	6	30	56	26	For eleven months; January omitted.
	Colored	0	1	0	0	0	1	1	8	0	1	0	6	3	1	0	4	26			
Fayetteville..	White	0	0	2	0	0	1	0	2	0	3	4	17	14	3	0	6	52	110	34	
	Colored	1	0	5	0	0	1	5	8	0	4	1	3	26	0	0	4	58			
Goldsboro	White	0	0	1	0	0	0	0	4	0	2	0	3	17	2	0	3	32	52	16	
	Colored	0	0	1	0	0	0	1	5	0	2	1	1	9	0	0	0	20			
Henderson ...	White	0	0	0	0	0	0	1	0	2	1	0	3	2	0	0	0	9	53	25	For ten months; July and November omitted.
	Colored	0	0	0	0	3	2	0	9	1	2	0	6	18	0	0	3	44			
Oxford.	White	1	0	0	0	0	0	2	3	0	2	0	1	6	0	0	2	17	42	9	For nine months; January, July and August omitted.
	Colored	2	0	0	0	0	0	0	4	2	0	4	2	7	1	0	3	25			
Raleigh	White	2	0	1	2	0	0	6	9	6	8	0	14	61	0	0	6	115	247	101	
	Colored	1	0	2	0	0	0	7	11	6	3	0	19	79	2	0	2	132			
Salisbury......	White	3	0	0	1	3	0	9	5	1	1	0	2	15	2	2	4	48	85	27	
	Colored	4	0	0	0	1	0	4	6	1	5	0	1	13	2	0	0	37			
Tarboro........	White	2	0	0	0	0	0	0	1	0	0	4	4	3	0	0	0	14	33	17	
	Colored	1	0	0	0	0	0	1	2	1	2	1	6	2	0	0	3	19			

TABLE VI.—SHOWING CAUSES OF DEATH—*Continued.*

Towns.	Races.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All other Diseases.	Accident and Violence.	Suicide.	Still-born.	Total Deaths. By Races.	Total Deaths. By Towns.	Deaths under Five Years.	Remarks.
Warrenton ...	White ..	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	7	0	For five months—January, February, April, June and August.
	Colored	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	3			
Wilmington..	White ..	1	0	5	1	2	1	13	15	5	15	16	11	45	1	1	5	137	436	170	
	Colored	5	0	15	1	1	2	16	37	3	22	22	28	108	9	1	29	299			
Greensboro...	White..	1	0	0	0	0	0	5	2	0	1	0	0	11	0	0	0	20	28	3	For eight months; January, September, October and December omitted,
	Colored	0	0	0	0	0	0	2	1	0	0	0	0	5	0	0	0	8			
Statesville...	White .	2	0	2	2	1	0	6	3	1	2	2	1	4	0	1	1	28	33	6	
	Colored	0	0	0	0	0	0	0	1	0	2	0	0	1	1	0	0	5			
Wilson	White ..	1	0	1	0	0	0	3	0	0	2	2	6	15	0	0	4	34	55	17	
	Colored	0	0	0	0	0	0	3	5	0	1	0	4	6	2	0	0	21			
Hillsboro	White .	1	0	0	0	0	0	1	1	0	0	0	3	4	0	0	0	10	26	6	Nine months; April, September and December omitted.
	Colored	0	0	0	0	0	0	0	7	0	0	0	1	8	0	0	0	16			
Total	White ..	20	0	12	6	6	5	52	56	18	45	30	78	226	11	5	42	611	1,386	510	
	Colored	16	1	23	1	9	7	44	118	14	46	30	81	309	21	1	53	775			

TABLE VII.—SHOWING CAUSES OF DEATHS FOR YEAR ENDING DECEMBER 31, 1892.

TOWNS.	RACES.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All other Diseases.	Accident and Violence.	Suicide.	Still-born.	TOTAL DEATHS. By Races.	TOTAL DEATHS. By Towns.	Under Five Years.	REMARKS.
Asheville.........	White	8	0	0	0	0	0	6	18	8	9	0	12	15	1	0	11	88	141	76	For 8 months: January, February, March and August omitted.
	Colored...	2	0	1	0	0	0	1	6	3	2	0	5	21	0	0	12	53			
Charlotte.........	White	5	0	0	0	3	0	4	4	3	3	2	7	7	2	0	3	43	100	32	For 5 months—July, September, October, November and Dec'r.
	Colored...	2	0	1	0	0	0	2	11	4	5	1	7	15	1	1	7	57			
Durham..	White	2	0	0	0	3	0	10	7	0	4	0	12	11	0	0	7	56	99	43	
	Colored...	1	0	1	0	0	0	6	9	0	1	2	6	9	4	0	4	43			
Fayetteville	White	0	0	2	0	0	0	3	3	0	2	0	2	16	0	0	3	31	89	31	
	Colored...	0	0	1	0	4	0	6	6	0	4	1	7	26	1	0	2	58			
Goldsboro.........	White	3	0	6	0	0	1	6	5	1	2	4	4	23	0	0	5	60	111	45	
	Colored...	4	0	0	0	1	0	4	7	0	3	0	2	23	3	0	4	51			
Greensboro......	White	1	0	1	0	0	0	1	0	0	1	0	0	5	0	0	1	10	18	0	For 5 months—January, March, October, November and Dec r.
	Colored ..	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	8			
Henderson	White	1	0	0	0	0	0	0	1	1	0	0	5	5	0	0	0	13	62	28	For 10 months; March and September omitted.
	Colored...	3	0	2	0	0	0	5	8	3	0	2	8	13	3	0	2	49			
Hillsboro	White	1	0	0	0	0	0	1	0	0	1	0	3	0	0	0	1	7	23	7	For 10 months; March and October omitted.
	Colored...	1	0	0	0	0	0	1	2	0	0	0	7	2	2	0	1	16			
Oxford.......	White	3	0	0	0	0	0	0	0	1	2	0	1	3	0	0	6	16	62	29	
	Colored...	1	0	1	0	0	0	2	8	2	0	0	11	12	1	0	8	46			
Raleigh............	White	9	1	2	0	0	0	10	16	10	11	0	19	51	2	1	12	144	322	142	
	Colored...	11	0	5	0	0	0	10	17	12	11	1	26	65	4	0	16	178			

TABLE VII.—SHOWING CAUSES OF DEATH—*Continued.*

Towns.	Races.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All other Diseases.	Accident and Violence.	Suicide.	Still-born.	Total Deaths. By Races.	Total Deaths. By Towns.	Under Five Years.	Remarks.
Rockingham	White	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0	5	9	5	For 8 months; January, February, March and April omitted.
	Colored	0	0	1	0	0	0	1	1	0	1	0	0	0	0	0	0	4			
Rocky Mount	White	0	0	0	0	0	0	2	0	1	0	0	1	5	1	0	0	10	15	3	For 10 months; June and August omitted.
	Colored	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0	5			
Salisbury	White	0	0	0	1	1	0	3	5	2	5	0	6	5	1	2	3	34	71	13	
	Colored	5	0	0	0	0	0	5	3	0	0	0	1	22	1	0	0	37			
Scotland Neck	White	0	0	0	0	0	1	2	0	1	2	0	0	2	0	0	2	10	18	5	
	Colored	0	0	0	0	0	0	1	1	0	2	0	2	2	0	0	0	8			
Southport	White	1	0	0	0	0	0	1	2	1	0	0	1	1	0	0	0	7	13	3	For 8 months; May, June, July and October omitted.
	Colored	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6			
Statesville	White	2	0	1	0	1	0	1	2	0	2	0	4	7	0	0	0	20	21	9	For 9 months; September, October and November omitted.
	Colored	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1			
Tarboro	White	3	0	0	0	0	0	6	2	1	1	1	10	6	0	0	1	31	53	21	
	Colored	0	0	0	0	1	0	2	0	1	1	0	5	10	1	0	1	22			
Weldon	White	0	0	1	0	2	0	1	1	0	0	0	1	2	1	0	0	9	26	7	
	Colored	0	0	0	0	0	0	0	3	0	1	0	2	7	2	0	2	17			
Wilmington	White	6	0	7	1	1	0	8	13	4	15	10	9	76	1	1	9	161	437	184	
	Colored	5	2	8	4	0	0	18	33	5	22	16	13	118	2	0	30	276			
Wilson	White	4	0	2	0	0	0	5	1	2	1	2	4	8	0	0	2	31	70	26	
	Colored	1	0	0	0	0	0	9	2	0	0	2	1	24	0	0	0	39			
Total	White	49	1	22	3	11	2	71	80	36	62	20	102	248	9	4	66	786	1,760	710	
	Colored	36	2	21	4	6	0	76	117	30	53	26	103	384	26	1	89	974			

GENERAL REVIEW OF STATISTICAL TABLES.

Cholera—During the past two years sporadic cholera was reported from three counties, one each in January and February, 1891, and one in July, 1892.

For the past six months the subject relating to the public health of most absorbing interest has been Asiatic cholera and the danger of its obtaining a foothold in our country. When it was knocking at the gates of our chief seaport, and a few scattering cases did actually occur within the city, great concern was very naturally and properly felt all over the United States, and some of the Boards of Health of other States thought it best to distribute information and instructions on the subject. This Board, however, while keenly watching the course of the disease, was of the opinion that it would be wisest to wait for further developments—at least until it showed a tendency to spread. It adopted this waiting policy for two reasons. In the first place, it did not wish to excite our people with the apprehension of a terrible scourge, possibly precipitating a panic, unless there were very good and sufficient grounds for anticipating it. In the second place, it was afraid that if it sounded the alarm and called the people to arms, so to speak, while the enemy was still at sea, or had at most succeeded in landing only a very few scouts, they might not respond when the danger became really imminent.

While the disease has disappeared from our quarantine stations and has almost died out in Europe, we fear that it is simply in abeyance, and that the warm weather of next spring may renew it in Europe and may start into activity germs that may have slipped into our own country during the cold of winter. In any event it behooves us to look well to our defences and make ready for an attack.

Cerebro-Spinal Meningitis.—In January, 1890, as set forth in the last report, this extremely fatal disease made its appearance in the Davis School at LaGrange, and extended in February to the citizens of the town, producing such demoralization as to cause the suspension of the school and its ultimate removal to another part of the State. During that biennial period it was reported from eleven counties altogether, while in 1891 it appeared in only two counties, and has not been reported at all during the current year.

Consumption.—As a supplement to what appears under this head in the proceedings of the conjoint session of 1892, we would give the mortuary statistics for the last two years, which emphasize the disparity in the death-rate in the two races. In a total white population of 57,000 the number of deaths was 120 or 2.1 per thousand, while in a total colored population of 40,000 residing in the same towns it was 212, or 5.3 per thousand. As possibly of some effect in causing this great difference in the death-rate, the habit which is almost apparently a racial peculiarity which the negroes have of sleeping with their heads covered, thereby breathing an impure and devitalized air a considerable part of the time, may be cited.

Diphtheria.—This dreaded disease, we are glad to state, has been decidedly less prevalent, and was not reported from a single county during the months of July and August, 1891. It has, moreover, been apparently of a milder type, the deaths reported from the various cities and towns keeping a record being only 13 as against 28 for 1889–'90. This does not mean, however, that it may not prevail in a more virulent form at any time, and it is of the highest importance that the people should not only realize its dangerous character, but the fact that it is contagious and the necessity for isolation of the patient, and after recovery or death the proper disinfection of the room, furniture and clothes.

Influenza ("*La Grippe*"), which was so widely prevalent in 1890 and 1891, has almost disappeared from the State, only two counties reporting it since April last.

Malarial Fever.—While the milder forms have been less frequent, the severer varieties, the hæmorrhagic and the pernicious, have been more so, according to the reports from the County Superintendents of Health. Notwithstanding this, however, the mortuary reports from the towns show the deaths in 1889–'90 to have been two-thirds greater in number than in 1891–'92. The striking effect of the proper application of sanitary principles in weakening and in many cases practically annihilating this wide-spread and insidious miasmatic poison, which causes so much sickness and so many deaths amongst us, is well known to sanitarians, and it is the intention of the Board to prepare and widely disseminate among the people the necessary information in such form it is hoped as to attract their attention and convince their judgment. It is believed that the not remote future will show a marked amelioration in this class of diseases.

Pneumonia continues to prevail at about the same level, we regret to say, since next to consumption it is the most fatal disease we have. Unfortunately, it is not preventable by any means yet discovered beyond what may be expected from a proper care of the person in cold weather, it being markedly more prevalent in such seasons, especially in January, February and March, with us, and practically absent in midsummer.

Scarlatina.—The quotations as to scarlet fever may be stated in the language of trade as "steady," the number of counties reporting its presence having been nearly the same every year for the past four. Judging from the number of deaths reported from the towns and cities it has been of a mild type. But we cannot expect it to be always so, and in itself and the serious nature of the sequelæ to which it often gives rise it is justly regarded with grave apprehension, especially by parents with young children, who are peculiarly liable to it. It is particularly dangerous to the public health because of its violently contagious character and the long persistence of the poison in the furniture and clothing. By way of illustration : Sir Thomas Watson, in his "Practice of Medicine," says that a maid-servant in a family in which scarlet fever had prevailed, on returning to the house which had been abandoned for a year playfully threw around her neck a strip of red flannel that had been used in that sickness, which she found in one of the empty bureau drawers, and in a few days she had the fever. Innumerable illustrations could be given to substantiate these facts, which render it imperative that all known precautions should be taken. What those precautions are will be given under the head of "Inland Quarantine."

Small-pox.—To what was said on this subject in the proceedings of the conjoint session of the Board with the State Medical Society at Wilmington, in May, 1892, we would add that only one case has occurred within our borders during the past two years. We are indebted for our fortunate escape chiefly, we think, to the vigilance of the health authorities generally throughout the country and the system of inter-State notification agreed upon by the different State Boards of Health. It certainly cannot be attributed to any efforts on the part of the people to protect themselves by vaccination, since there has been, and we very much regret to say is, woful indifference on the subject among them, as was clearly shown during the discussion in the conjoint session ; a want of appreciation of its demonstrated merits that nothing, we fear, short of the appearance of small-pox itself will overcome.

Typhoid Fever continues to be the most prevalent, and also the most fatal, of all the preventable diseases appearing in our State during the past two years. The largest number of counties reporting its presence was 38 each in July and August, 1891, and the smallest, 5 each, in February and March, 1892. The total number of deaths reported from the towns was, in 1891 36, and in the first ten months of 1892 73, as against 66 in 1889 and 77 in 1890, in about the same total population—100,000 in round numbers. The Board, realizing its importance, hopes to redouble its efforts to diminish its ravages. With that object in view, a communication, which appears elsewhere in this report, suitable for the general public, explaining the nature of its origin and the best means of preventing its spread, has been sent to the newspapers of the State with a request to publish for the instruction of their readers.

DISEASES PREVAILING AMONG DOMESTIC ANIMALS

Glanders.—Only one case has been reported in the past two years. The proper precautions were immediately taken and the disease promptly stamped out. On account of its communicability to man this disease is of special interest.

Cholera in Hogs was reported from 64 counties in 1891 and 35 in 1892. The annual money loss to the State from this cause is quite large. From recent investigations by the Bureau of Animal Industry at Washington it appears that something can be done in the way of prevention, and with the approval of the authorities of the Agricultural Department the latest facts on this subject will be given to our farmers through its *Bulletin.*

VITAL STATISTICS.

In *The Bulletin* of the Board for November, 1891, there appeared the following:

VITAL STATISTICS IN NORTH CAROLINA.

During the past week a circular letter has been sent to the Mayor of each town in North Carolina having a population of 1,000 and upwards, setting forth the following:

There is no system of vital statistics in this State. The only semblance of such being the monthly reports sent to the State Board of Health from some ten or twelve towns in the State. Of these only a few send *regular* reports. and the great majority of them depend on the voluntary efforts of some unpaid individual to collect the data, and they have no ordinance *requiring* the registration of deaths. It is the earnest desire of the State Board of Health to correct this evil as far as in them lies, and to this end these letters have been sent out to the persons in charge of the municipal affairs throughout the State, asking their aid in the matter. These men, above all others, should have at heart the welfare of the towns and the State at large, and as there are no State laws enforcing the registration of mortuary statistics, we must depend on the different cities and towns to make their own ordinances.

A glance at the mortuary tables in *The Bulletin* of the Board of Health will lead one to notice at once the absence from these tables of such important towns as Charlotte, New Bern, Winston, Reidsville, Asheville, Concord, Elizabeth City, Washington, and a good many others which, though having a smaller population, are representative towns. These statistics are not only of importance to the Board of Health in their efforts to ascertain and remove the causes of disease and death in the State, and as a means of testing the results of sanitation; but one of the first things a prospective immigrant does, or should do, is to look into the death-rate of the place to which he is looking for a home for his family, and it is important and desirable that an accurate and official record be furnished for the information of this class.

When reports are received from towns only spasmodically, they are practically of little value, for a true estimate of the healthfulness of a place cannot be based on a death-rate calculated from a report that omits three or four months in the year, and these, probably, the months of greatest mortality. And to be of the greatest value, it must be apparent that means are adopted *to enforce* the registration of every death that occurs within the corporate limits of the town, and the population should be definitely ascertained, not guessed at. These reports are not desired or published as an advertisement for towns offering inducements as health-resorts, but for scientific purposes—therefore we desire the actual death-rate, and not one that will be attractive to home-seekers merely.

We would, therefore, urge upon the mayors and the medical profession of the towns to which these letters have been sent, the importance of having their city or town council to pass ordinances that will *require* the registration of each death that occurs in the town with some *paid* official, a part of whose duty it should be to forward to this office, on the first of each month, a copy of all the registrations for the preceding month. This registration should embrace in each case the name, age, sex, race, time and cause of death, and should be endorsed by the attending physician or some other reliable person. These reports will be published in the "Bulletin," and used in making up the biennial report to the Governor.

In this enlightened day it is scarcely necessary, I hope, to call attention to the great value of such a record that has been carefully kept for a number of years. Why, frequent inquiries are received at this office for information on the mortuary statistics of the State, and we have to acknowledge, with shame, that they are so meagre and unreliable as to be of almost no value.

Can we not prevail on the profession and the city and town officials to give their interest and aid to this important matter, and with the new year of 1892 start a system of vital statistics, which, though it may be imperfect at first, will soon grow to such a state of perfection as to be of great and recognized value?

Write to the Secretary of the Board, Mr. Mayor, for any information or suggestions you may desire, and he will give your letter prompt and personal attention.

THOMAS F. WOOD, M. D.,
Wilmington, N. C. *Secretary.*

Although the number of towns sending in mortuary reports has somewhat increased, the response to the appeal was far from encouraging. We believe it to have been due to the indifference that arises from an imperfect understanding of the matter. No live, wide-awake town in these progressive days can afford to be without some provision for looking after its health interests. Selfish consideration for its own material advancement, to say nothing of a decent regard for the health and lives of its people, should, it seems to us, be sufficient to bring it about. But it appears that it has not been the case, and the Board proposes to renew its efforts, resorting not only to letters but to personal interviews with the authorities of the more important towns if required. The necessary blanks, with other machinery, will be supplied, so that a start may be made with the smallest expenditure of effort and money possible.

It is of the highest importance to the cause of vital statistics in this State that the towns should collect them. It cannot be done with fullness and accuracy in rural districts but it can be in towns and cities with comparatively little trouble and expense. If satisfactory mortuary statistics could be obtained from the towns having one thousand or more inhabitants scattered all over the State from Elizabeth City to Asheville we would have reliable samples of the health conditions obtaining in every section. At present, certain of the best insurance companies, we are informed, will not permit their agents to write a policy for anyone residing east of the Wilmington and Weldon Railroad. We are satisfied that if full health reports that might be relied upon could be obtained from that section, not only the discrimination made against it by the insurance companies, but also by prospective immigrants, would be done away with. And not only would these reports be of benefit in the manner indicated, but they would stimulate the municipal authorities in all sections to greater effort in carrying out proper sanitary regulations in order to diminish as far as possible the death-rate. The effect of this in saving the people from much avoidable sickness and many deaths that need not occur, can be seen at a glance.

In this connection it is proper to say, that owing to the failure of many County Superintendents to send in their monthly reports altogether, or, when they did, with promptness and regularity, it was deemed advisable to appeal to them in the following communication which appeared in *The Bulletin* for November, 1892:

A WORD WITH THE COUNTY SUPERINTENDENTS OF HEALTH.

One of the duties of the Secretary of the State Board of Health is the preparation for publication by the State of our *Monthly Bulletin*. It is evident that the fresher the sanitary news it contains the more valuable it is. If anything is to be done, the very fact that it is done promptly adds to its effectiveness. It is also desirable, of course, that when anything is done it should be done as well as possible. We cannot claim that the issue of a bulletin of news that is a month old is a creditable performance, but under the conditions that now obtain we can do no better. Unless the matter is on hand it certainly cannot be published.

My first experience in getting out this number has brought forcibly to my attention certain obstacles to carrying out the above ideas, which all will, I think, admit to be sound: and it is because these obstacles can only be removed by the County Superintendents that I make this appeal. In this connection, in relation to the matter of promptness of publication, I would respectfully call attention to the fact that many Superintendents send in no report at all, (in this issue 22, or more than 33 per cent., have failed altogether to report), and to the further fact that very many have been very dilatory in performing that duty.

The frequent occurrence of "No report" shows an amount of carelessness or indifference that must appear to our readers as very discreditable. It looks so thriftless and "slack-twisted," as the old-time folk would say, that we should not longer make such an exhibition of ourselves to other Health Boards and sanitarians generally to whom *The Bulletin* goes. In section 8 of the act relating to the Board of Health these words occur: "A failure to report by the tenth of the month for the preceding month shall subject the delinquent to a fine of one dollar for each day of delinquency, and this amount shall be deducted from the salary of the Superintendent by the Board of County Commissioners on authenticated statement of such delinquency by the Secretary of the State Board of Health." Men of spirit can easily understand how repulsive to my feelings it would be to call the attention of the County Commissioners to such delinquencies for the purpose of punishing the delinquent by curtailing his salary,.already in most instances ridiculously meagre. It may be my duty to do so, but I cannot bring myself to it while I believe, as I do, that the gentlemen at fault in this respect are so unintentionally and need only to have the importance of promptness brought plainly before them to insure reformation. My lamented predecessor—the most kind-hearted and long-suffering of men—was in the habit of sending a notice to those who had not reported on the 10th of the month, and waiting until the 20th before making up his "copy." Such a long delay makes it difficult to get *The Bulletin* in the mail before the end of the month. So, hereafter I shall send a reminder on the 5th of each month and wait until the 10th, the day set by the law. It is doubtless true that the principal cause of delay on the part of a Superintendent in sending in his report is the delay on the part of the individual physicians in sending in their reports to him; but I would request that you impress upon them the importance of promptness, and that you do not wait on them longer than the 5th. I would also beg of you not to fail to send in some kind of a report, no matter how incomplete, that the words "No report" may not appear in our future issues.

Now, gentlemen, will not every one of you show interest enough in this matter of sending in your monthly reports to let me have them immediately on receipt of the notice at the very latest, and sooner, if possible? By so doing you will fulfil a duty required of you by the law under which you hold office, and at the same time forward the health interests of the State.

Do you need blanks for your own reports or for distribution among the physicians of your county? If so, notify me by postal card and I will immediately supply you.

The new Secretary of the State Board does not claim to be the possessor of all sanitary knowledge, and he would therefore thank his associates in the beneficent work of preventing disease—the County Superintendents, as well as all other humane physicians who must be interested in it—for any suggestions they may think proper to make. Such suggestions would be gratefully received, carefully considered, and utilized whenever practicable. It is a grand work we are engaged in, and to make it really effective we must all pull together with a will.

RICHARD H. LEWIS, *Secretary.*

And since there was much complaint on the part of the Superintendents that the other physicians would not report to them, the Secretary availed himself of an opportunity to send out, without expense to the Board, the following circular letter to every licensed physician in the State whose address was known:

To the Members of the County Boards of Health:

DEAR DOCTOR—It is the desire of the State Board of Health to make its work as effective as possible. To that end, the prompt report of diseases dangerous to the public health is of the highest importance.

The County Superintendents of Health complain that many physicians, members of the County Boards, as all licensed physicians are *ipso facto*, fail altogether to make such reports to them. If you have not heretofore done so, will you not now kindly lend your aid to the good work we are trying to accomplish by reporting such cases *promptly* on the first day of each month for the month just past to the Superintendent of your county? He will gladly supply you with the proper blanks if you have none.

Very truly,

Raleigh, N. C. RICHARD H. LEWIS, *Secretary.*

QUARANTINE.

INLAND QUARANTINE.

The act relating to the Board of Health, section 9, says: "Inland quarantine shall be under the control of the County Superintendent of Health, who, acting by the advice of the Local Board, shall see that diseases dangerous to the public health, viz., small-pox, scarlet fever, yellow fever and cholera, shall be properly quarantined or isolated at the expense of the city or town or county in which they occur." But unfortunately the County Superintendent is not always notified, and there is no provision in the law requiring specifically such notification to be given and in that respect it should be amended. That no one has a right to jeopardize the health and lives of his neighbors is too plain a proposition to require argument. No question of inconvenience, or any other consideration on the part of the family or the attending physician, should excuse a failure on the part of the latter to report immediately upon the making of the diagnosis a case of either of the diseases above mentioned to the County Superintendent, whose duty in the premises is defined. But not sufficiently so, for no instructions are given as to disinfection, which is second only in importance to isolation. The complete disinfection of the room and of all articles at any time exposed to the effluvia from the sick person, as well as prompt notification by the attending physician, should be made compulsory by the imposition of a penalty for neglect—as is the case already in the latter respect in our capital city of Raleigh.

MARITIME QUARANTINE.

Our chief seaport, Wilmington, is our most exposed point, and is the gateway through which the diseases most dangerous to the public health—cholera and yellow fever—are most likely to effect an entrance into our State. It is, therefore, of peculiar importance that our defences at that point should be made as strong as possible. During its meeting in Wilmington, on September 7, 1892, the Board visited the Quarantine Station at Southport in a body. We cannot say truthfully that we inspected the Station for there was no Station to inspect, but we did confer with the quarantine physician, Dr. W. G. Curtis, and found him, we are glad to say, well informed as to the duties of his office, and from all we could learn, performing them with all faithfulness and as thoroughly as the circumstances would allow. The quarantine facilities of the port are totally inadequate and proper provision should be made without delay by the incoming Legislature. As to what is needed, we would refer the reader to a letter from Dr. Geo. G. Thomas, President of the Quarantine Board of Wilmington, printed in another part of this report.

The city and State have been very much blessed in having a conscientious quarantine officer of such ability and experience as Dr. Curtis. Thanks to his efforts, ably seconded by the other members of the Quarantine Board, the late Secretary of this Board, Dr. Thomas F. Wood, and Dr. George G. Thomas, and since the death of the former, Dr. T. A. Burbank, no pestilential disease has been allowed to effect an entrance for many years. But we have no right to expect an indefinite continuance of such good fortune, and preparation should be made to resist an assault in force—and at once, in view of the threatened invasion of cholera next spring or summer. "In time of peace prepare for war," is an axiom that we cannot afford longer to neglect.

INSTRUCTIONS FOR THE PEOPLE IN MATTERS OF HYGIENE.

This is really the most important work of the Board. No law can be successfully administered unless it is supported by public opinion. In the minds of those who are informed on the subject, there is no question of the very great value of sanitation to the people, of the wisdom of most of the statutory laws bearing thereon, of the rules and regulations promulgated by those having charge of the health departments or of the great benefits that have been derived and can be obtained in still larger measure from their proper application and enforcement. But the great body of the people are ignorant of sanitary principles, and, consequently, do not appreciate their value nor the importance of making a personal application of them. Not perceiving the reason for the law or regulation, they often practically refuse to submit, or yield a grudging and half hearted obedience that is but little better. Besides, this condition of public sentiment is inimical to the establishment of local boards of health, or the appointment of health officers, especially if any tax is required. To overcome this indifference arising from ignorance is, as said above, our most important work at this stage of our sanitary development. We must educate the people on this line. The time to begin with the individual citizen is in childhood and the place the public school, for the reason that instruction on this subject can be therein obtained with greater certainty and on a larger scale at the period of life when the mind is most susceptible to new impressions. It is gratifying to note that the teaching of hygiene in our public schools is compulsory, but we think the selection of the text-books on that subject should be given to the Board of Health, or, at least, submitted to it for approval. But it will be very many years before the school-children of to-day are the heads of families or directors of the affairs of State, and we must reach those who are now in charge. To that end, in addition to our regular monthly *Bulletin* embodying the health reports from the various counties and municipalities, together with sanitary suggestions and the occasional distribution of pamphlets and circulars through the mails, we have recently inaugurated the plan of publishing, from time to time, in such of our newspapers as will print them without charge for the instruction of their readers, short articles on health subjects of a plain and practical character. The two that have been issued up to the present time, together with the circular letter sent to all the editors, are appended.

While we admit that most of the sanitary seed we wish and intend to sow broadcast over our State will, in accordance with the natural law applying to all kinds of seeds, fall by the wayside, on stony ground or among thorns, we feel sure that some will fall on good ground and bring forth fruit—some thirty, some sixty and some an hundred fold. Every seed that takes root and brings forth fruit will scatter other seeds in its neighborhood and there is no computing what the total effect may be in a few years.

THE NORTH CAROLINA BOARD OF HEALTH,
Office of the Secretary,
RALEIGH, N. C., October 6, 1892.

Editor ....

DEAR SIR:—It is the desire of the North Carolina Board of Health to convey to the people of the State in every practicable way information and instruction as to the preservation of their health. Will you, therefore, in that interest of your readers, kindly publish the enclosed?

Would you also be good enough to publish other short practical articles on health subjects which I would be pleased to send you from time to time, say about once a month?

Yours truly, RICHARD H. LEWIS, M. D.,
Secretary.

ANNOUNCEMENT BY THE SECRETARY OF THE STATE BOARD OF HEALTH.

In the death of Dr. Thomas F. Wood, of Wilmington, late Secretary of the North Carolina Board of Health, the State lost one of its most patriotic and useful sons. He was an able, conscientious and accomplished physician, an amateur botanist of note, editor and proprietor from its beginning of the present *North Carolina Medical Journal*, always in the forefront of those working for the elevation and advancement of his profession, and doing more to promote both than any man we ever had; but the nearest thing to his heart, second only to his love for his Divine Master, was the North Carolina Board of Health—which was originated by him and kept alive during the years of its feeble infancy only by his personal devotion and sacrifice of both time and money—and through it the welfare of the people of his State.

Having been honored by the Board in my election to the Secretaryship made vacant by his decease, I cannot assume the duties and responsibilities of the office he adorned without thus testifying to his high and admirable qualities, the loss of which is irreparable.

In taking up this work I feel that it would be well to remind the people of the State that the Board of Health was created for their benefit—for the purpose of acquiring and distributing as thoroughly as possible information and instruction as to the best means of preventing disease. Any citizen of the State, therefore, desiring such information would confer a favor by writing to the Secretary, who would cheerfully answer his inquiries.

The subject of pre-eminent interest at present is the epidemic of cholera threatening our country. The Board has watched the indications with sleepless eye, and has given the subject the most thoughtful consideration, but it has not deemed the danger imminent enough at any time to justify publications which would probably excite and alarm unnecessarily many of our people. The danger is daily growing less, and the Board does not anticipate any trouble during the coming winter, but fears the awakening in the warm weather of spring of the germs which may slip into the country during the cold weather, when the vigilance of the health officers at our ports is liable to be relaxed. Should its fears be justified, the people may rest satisfied that it will exhaust every means within its power to keep it out of our State. From time to time the Secretary proposes to publish, in all the papers in the State kind enough to print them, short practical articles on matters relating to the preservation of health. In the meantime, if you need information or advice on such subjects, write to

RICHARD H. LEWIS, *Secretary*,
Raleigh, N. C.

HEALTH NOTES FOR THE PEOPLE FROM THE N. C. BOARD OF HEALTH.

Typhoid Fever.

The fact that a much larger number of persons die in our State from typhoid fever than any other preventable disease, suggests the propriety and the importance of bringing to the attention of our people certain facts in regard to its origin and the best way to check its spread.

The mere mention of cholera and yellow fever, those strange and foreign pests, suggests to everyone the advisability of taking every precaution against them; but typhoid fever, which in the course of years slays its thousands, where hundreds or even tens succumb to the former, is regarded as a matter of course, a necessary evil to be endured, and not a thought as to the prevention of its spread is given. This indifference is doubtless due to ignorance of its true nature and of the proper weapons with which to fight it, otherwise such disregard of the safety of others would be criminal, as I think will sufficiently appear later on.

Typhoid fever is a specific disease, that is, it is not produced by general conditions, but comes from a special germ or seed, just as no concatenation of circumstances known to man could produce a crop of wheat unless the seed wheat be first put into the ground. These germs or seeds flourish in water, not necessarily impure water, according to the chemical tests, and while it is possible that they may be breathed into the system, the accepted opinion is that they are almost invariably swallowed, taken in with our drink.

Where do they come from, and how do they get into our drinking water?

The characteristic lesion, as we doctors say, in typhoid fever is an ulceration of the small intestine in certain little glands called Peyer's patches. These ulcers are caused by the germs which are present in myriads, and which are carried out of the body in every evacuation. The discharges are thrown out on the ground usually. The germs, which are very hardy, soak through the soil into our wells, or those of our neighbors at perhaps some distance, or are washed by heavy rains into streams which furnish the water-supply of towns and cities.

As mere abstract assertions are not apt to make much impression, I will give an illustration in the concrete, demonstrating the truth of what I have asserted.

In the Spring of 1885, Plymouth, Pa., a mining town of about ten thousand inhabitants, on the banks of the Susquehanna, was visited by a fearful epidemic of typhoid fever, in which there were over eleven hundred cases, nearly all of them occurring within three months. The town was supplied with water mostly by a beautiful pure mountain stream on the steep banks of which there was only one house. To that house there came in January, a man from a distance who had typhoid fever. His dejections were thrown out on the snow, quite deep and frozen hard, and remaining so until a thaw on the 26th of March. During the latter part of the freezing weather the town was supplied by water pumped from the Susquehanna. When the snow melted and ran into the mountain stream filling the storage reservoirs, that water was turned into the mains. On the 9th of April, just fourteen days afterwards, the average time it takes typhoid to appear after exposure to its cause, the first case occurred. During the terrible scourge that immediately followed it was demonstrated that only those drinking the mountain water were attacked, while those confining themselves entirely to using the water of wells, many of them according to chemical analysis very foul, or to that of the Susquehanna, which received the sewage from Wilkesbarre, a city of thirty thousand inhabitants, three miles above, not to speak of a number of towns higher up, escaped altogether. Could anything be plainer than that the eleven hundred people were poisoned by a water in other respects remarkably pure, in which there existed the specific germs of typhoid fever? Or can anything be plainer than the fact that if the proper precautions had been observed and the excreta of the case on the bank of the stream, been disinfected, that is, had the germs been destroyed before they were thrown out, that the pestilence would not have occurred? How criminal would his attendants have been if they had known the danger and the remedy for it. Now the object of this communication is to place upon every person who reads it the responsibility that arises from a knowledge of these three facts: 1. That typhoid fever is nearly always conveyed through drinking water contaminated by the undisinfected discharges of some person affected with that disease. It is often impossible to trace the connection in individual cases, but a great many incontrovertible proofs render such an inference, where the cause cannot be ascertained, more than reasonable 2. That the only practicable way to prevent its spread is to destroy the germs while they are within reach by the use of a proper disinfectant. 3. That a good disinfectant can be obtained by every man, no matter how poor. There are a number, but I will mention only two: 1. Boiling. The clothing and bedclothing of the patient, especially if soiled, should be boiled for, at the very least, a half hour. 2. Milk of Lime. This is prepared by pouring on a quart of pieces of quicklime a quart of water, which will reduce the lumps to powder, whereupon three quarts more of water should be added. Keep in a well closed vessel and shake before using. Add an equal quantity to the dejecta to be disinfected and allow mixture to stand at least an hour before emptying.

The attending physician, if well posted and conscientious, will always give the same or similar directions to those above, but the best of us will sometimes nap, and if you should have a case of typhoid fever in your family and your doctor nods, wake him up.

There are a great many things about typhoid fever interesting and important for the general public to know, but I cannot impose further upon the generosity of the publisher of your paper, who kindly prints this free of charge simply for the good of the community.

RICHARD H. LEWIS, M. D.,
Secretary

ACT RELATING TO THE BOARD OF HEALTH.

As at present constituted, the State Board of Health is merely advisory in its functions, having no power to do more than collect vital statistics, give general advice in sanitary matters to the people as a whole, and particular advice only when asked. For many reasons this is the proper attitude in relation to individuals and corporations for it to occupy. But no considerable aggregation of people should be without some kind of sanitary supervision, and where the local authorities are too indifferent or parsimonious to provide it, it should be made the duty of the State Board to at least appoint a health officer to be paid by the community, as is done (*e. g.*) in Connecticut.

The good effect of the enforcement of proper sanitary rules and regulations is now so thoroughly demonstrated that this matter could not reasonably be regarded by thoughtful men with indifference at any time, but in case of an epidemic, of cholera we will say, there could be no question about it. Looked at from a sanitary point of view, no man, except a rigid and consistent hermit, liveth unto himself, and in these days of rapid and frequent intercommunication no community liveth unto itself. No community has the right to breed disease to be sown broadcast among the people of a whole State. The law should be so amended that every town may be compelled, if it neglects voluntarily to do so, to confine and stamp out as soon as possible any epidemic or contagious disease dangerous to the public health. The very presence of such a law on the statute books would cause the town authorities to look after health matters for themselves. The writer has very strong convictions on the subject of local self-government, and he believes in as little government of any kind as may suffice for the preservation of law, order and health, but self-preservation is the first law of nature, and the State should provide the means for protecting an immense majority of her children against the carelessness, indifference or meanness of a few. The act should be amended in many other respects so as to give greater power to the Board to regulate sanitation in the State, but it is unnecessary to go into details at present since the Board will meet at the capital in January for the purpose of deciding upon and presenting to the General Assembly, which will then be in session, the changes and additions which they, after consultation, may deem advisable for the good of the whole people.

SPECIAL WORK OF THE BOARD.

IN THE MATTER OF THE PROPOSED REX HOSPITAL AT RALEIGH.

The action of the Board in this matter is fully set forth in the subjoined correspondence. In consequence of the resolution of the Raleigh Academy of Medicine and the report of the Committee from the Board of Health, application was made to the Superior Court by the Trustees of the Rex Hospital Fund for permission to sell the land devised by the late John Rex for the location of the hospital for the indigent sick of Raleigh called for in his will, in order to purchase other land with better sanitary surroundings. The Court granted the desired permission; the land now in possession has been advertised for sale and a more salubrious site will soon be obtained.

RALEIGH, N. C., May 7, 1892.

R. H. BATTLE, ESQ., *Chairman Trustees Rex Hospital.*

DEAR SIR:—In reply to your communication of May 3, we were instructed by the Academy, at a special meeting, May 6, to send you the following resolution, which was unanimously adopted:

Resolved, That the Raleigh Academy of Medicine acknowledges the courtesy shown it by the Trustees of the Rex Hospital in inviting it to present plans and specifications for hospital buildings; but, inasmuch as the proposed site is, in its opinion, after inspecting the grounds in a body, very undesirable, if not altogether unfit, for that purpose, the Academy would respectfully request the Trustees, before erecting the buildings, to have the site passed upon by the State Board of Health, and if condemned by that authority, that an appeal be made to the Supreme Court or the Legislature for a construction of the will of the late John Rex, in view of the unsanitary condition and surroundings, as to whether the location of the hospital buildings might not be changed.

Very respectfully,

K. P. BATTLE, JR., M. D., *President.*

A. J. BUFFALOE, M. D., *Secretary.*

NORTH CAROLINA BOARD OF HEALTH,
Thomas F. Wood, M. D., Secretary,
WILMINGTON, N. C.

R. H. BATTLE, ESQ., *Chairman of the Trustees of the John Rex Estate.*

DEAR SIR:—In compliance with your request, we, a committee from the North Carolina Board of Health, have visited the land devised by the late John Rex, with a view to determine, as far as we were able, its fitness for the location of a hospital for the indigent sick of the city of Raleigh.

After a thorough inspection of the land and its surroundings, we hereby submit our report as briefly as possible:

1st. In our opinion the site is not a desirable one for the purpose. It is located in that portion of the city which, according to the official reports, has the largest proportionate number of deaths and the greatest amount of sickness. Through it runs a sluggish stream, extremely liable to overflow, and which is the only receptacle for the drainage of a large area of the suburbs of the city. The land is low, devoid of timber protection, and lies directly in the course of the prevailing winds, which blow over a notoriously miasmatic stretch of broad cotton and meadow lands.

2d. To grade, drain and sewer the Rex land, preparatory to making a suitable site for the location of a hospital, a very considerable expenditure of money would be necessary.

3d. After this is done, a far greater outlay must be made to protect the hospital site from the unhealthy emanations arising from very large areas of adjacent properties now owned by private individuals.

4th. It is our opinion that the John Rex lands will be fit for the location of a hospital only after all these objectionable features in its situation and surroundings are corrected by extensive and extremely costly sanitary measures.

We have the honor to be,

Yours very truly,

HENRY T. BAHNSON, M. D., *President.*
JAMES A. HODGES, M. D.
THOMAS F. WOOD, M. D., *Secretary.*

IN RELATION TO COUNTY JAILS AND HOMES.

The recent work of the Board in this direction is set forth in the appended correspondence:

STATE OF NORTH CAROLINA,
Office Board of Public Charities,
Chas. Duffy, Jr , M. D , President,
C. B. Denson, Secretary,
Raleigh, N. C., Oct. 1, 1892.

Dr. Richard H. Lewis,
Secretary of the North Carolina Board of Health, Raleigh, N. C.

Dear Sir:—By direction of the Board of Public Charities of North Carolina, a pamphlet of notes and instructions in relation to the moral and physical treatment of the inmates of County Homes, prisons, workhouses, municipal police stations, etc., is being prepared with a view of ameliorating the condition of such unfortunate persons in our State. So far as this subject includes proper sanitation, we would like to avail ourselves of the official suggestions of the State Board of Health as the proper line of suggestion; and I take the liberty to ask the favor of a copy of the same if prepared, or your formulation of a suitable sanitary code.

With great respect, yours very truly,
C. B. DENSON, *Secretary.*

North Carolina Board of Health,
Richard H. Lewis, M. D., Secretary,
Raleigh, N. C.

Raleigh, October 25, 1892.

Captain C. B. Denson,
Secretary Board of Public Charities.

My Dear Sir :—In compliance with your request to furnish rules for the sanitary management of our jails and county homes for the poor, I would respectfully submit the following. The general rules for the preservation of health apply alike to all persons, but where a number are confined in close quarters under the complete control of one having authority to enforce them, they ought to be, and can be, more thoroughly carried out than under ordinary circumstances. They are nearly all summed up in one word, *cleanliness*, and relate to the air breathed, the water drunk, the food eaten, and to the person and its surroundings :

1. *The Air.*—Sanitarians are agreed that sufficient space should be allowed to permit a complete change without sensible draft of the air therein contained at least twice every hour. To accomplish this a

minimum space is 600 cubic feet per individual, with such ventilating arrangements as to produce the required change in the air. In summer this is easily effected, but in cold weather the problem is more difficult. Without knowing the conditions peculiar to each jail or home specific directions cannot be given, of course. In a general way, however, I would suggest: For the homes which are in the country the allotment of at least 1,000 cubic feet of air-space per head, with open fireplaces and plenty of wood. For the jails, more particularly for those in which the prisoners are confined in the cells of a steel cage situated in the centre of one large room, I would recommend the use of a jacketed stove and ventilating shaft. The mode of operation is as follows: An inlet pipe of sufficient size, with a valve to diminish the amount of air in extremely cold weather, extending from the outside of the building some distance from the ground, opens under the stove. The fresh air, passing between the hot stove and the enveloping jacket, pours into the room from the top, *warmed*. A ventilating shaft with an opening just above the floor having been provided near the stove, the pressure of this influx of warm fresh air forces the cold foul air on the floor out the shaft and makes a complete circuit of the room, the point of exit being practically the same as the point of entrance. Another reason for placing this shaft near the stove is, that being warmed thereby it draws better. This arrangement is feasible at a moderate expense anywhere and should be generally adopted. Where the construction of the jail prevents its employment a large space per prisoner—at least 1,000 cubic feet—should be provided.

2. *Water.*—Purity of water is equally as essential to health as purity of air. Indeed, while bad air slowly saps the vitality, more specific diseases, as typhoid fever for example, are introduced into the system through the water we drink than through the air we breathe. To preserve the purity of the water supply no accumulation of filth of any kind, especially of human excrement, should be permitted near enough to contaminate it, either by directly draining into it, or by soaking through the ground.

3. *Food*.—It goes without saying that an abundance of good, nutritious food, simple in character but well cooked, should be supplied. A due regard to variety should be observed, care being taken to furnish, in addition to the staple articles of bread and meat, fresh as well as salt, vegetables of some sort—the ordinary garden truck when in season and at other times potatoes and onions.

4. *Cleanliness*.—(*a*) Of the Person. (*b*) Of the Premises. (*a*) To insure the proper action of the skin, so instrumental in the causation particularly of catarrhal troubles, and to prevent the generation of vermin, cleanliness of the person is necessary. Consequently, frequent bathing, at least once a week, should be enforced. (*b*) Cleanliness of the premises from a sanitary point of view is of as much if not greater importance

than that of the person. Accumulations of filth of any kind afford congenial resting places for disease germs. Developing therein in enormous numbers and becoming dry, they float into the air as dust and are taken into the system through the nose and mouth, or contaminate the drinking water by settling into it if exposed in an open pail.

I have been shocked to learn that there are jails in the State infested with vermin. If such be the fact, it is an outrage on decency that should not be tolerated in a civilized community, and shows such woful incapacity on the part of the officials in charge as to entitle them to instant dismissal, if not severer punishment. When a house and its contents once become thoroughly infested with vermin, it is not always an easy matter to eradicate them, and therefore a suggestion on this point may be acceptable. Probably the best way to exterminate vermin by wholesale is by means of the fumes of burning sulphur—sulphurous acid gas or sulphur dioxide—fire and brimstone acting in concert having constituted an admirable purifier from time immemorial. The method of using is as follows: Since it takes considerable time for the gas to do its work completely, and since it is important to have it as concentrated as possible, the first step is to hermetically seal, as perfectly as the conditions will permit, every avenue of escape, no matter how small; the windows and doors being caulked with tow or cotton, as well as every other crack that can be found. Next, as the action of the gas is very much more powerful in the presence of water, the walls and all articles of furniture—everything, in short—should be well wetted. Then placing an iron vessel, containing two pounds of sulphur for each thousand cubic feet of air space in the centre of a large tub with two or three inches of water in it to prevent setting fire to the building in case some of the burning sulphur should fall out, on its legs if it is a pot and has any, otherwise on bricks, light the sulphur. As it is sometimes hard to ignite, a little alcohol poured on before applying the match would facilitate matters. The door of exit should then be closed and tightly chinked from the outside, and not opened for ten or twelve hours. During this time the prisoners, in another room, should have their hair cut short, after which they should be stripped and thoroughly washed with carbolic soap from the crowns of their heads to the soles of their feet literally. As soon as cleaned they should step into another and unpolluted room and put on fresh clothes. Their infested clothing, and bed-clothing, should be at once well boiled, and the room promptly scalded in order to destroy any vermin that might have fallen on the floor during the undressing. Before returning the prisoners to their cells the windows and doors should all be opened to allow the escape of the sulphur fumes.

The above method may be considered rather heroic, but such work can be effectively done best by wholesale, and it is, indeed, less troublesome and expensive than when done by piece-meal. There are other ways of accomplishing the purpose: simple hot water, if thoroughly applied in th boiling state, answering very well: but it is hard to get a sufficient quantity of boiling water at one time; it soon cools, and is, moreover, by no means so searching as the sulphur gas.

All premises, public and private, should not only be made clean, but kept so. This applies with peculiar force to those institutions whose inmates are kept in a state of close confinement—as jails, penitentiaries, and asylums for the insane—and in such a thorough house-cleaning once a week, if not daily, should be a standing order.

General Remarks.—In connection with the care of the poor, I would suggest in addition to what has been said above, that they be kept actively employed in some light work as far as may be consistent with genuine kindness. Idleness is admittedly the handmaid of vice, and to a certain extent it undoubtedly is of disease. When the normal functions are kept in full action the blood—the life-giving current—flows freely and health is promoted; but when the mind and muscles do not fulfil the functions for which they were created that stream becomes sluggish and foul and vitality is lowered. However, it is so well known that exercise of the body with employment of the mind is conducive to health that it is not necessary to say more on this subject.

After all has been said that could be said on the subject of rules and regulations for the government of such institutions as those we have under consideration, it remains true that the most effective agency in their proper conduct is a good manager. A sensible, humane and conscientious man in charge is a *sine qua non*, and our county authorities should never permit any political or other considerations to prevent the appointment of such a man to the care of the poor, many of whom are lunatics, and of the helpless prisoners.

As the number of the insane increases from year to year without a corresponding increase in accommodations in State asylums, the question of caring for the incurable lunatics by the counties becomes more and more urgent. With a view to furnishing something practical and valuable on this line, I requested my friend, Dr. P. L. Murphy, the able Superintendent of the State Hospital at Morganton, to get up for me plans and specifications for quarters suitable for the county insane. I herewith hand you the same, and in this connection I wish to express my indebtedness not only to Dr. Murphy, but also to his amiable and efficient Steward, Mr. Scroggs, who prepared them under the Doctor's direction.

The sanitary suggestions above set forth apply to them with peculiar force because of their entire inability in most instances to help themselves; but directions as to their specific management must be left to the County Superintendent of Health. Unfortunately, however, in many if not most of our counties sufficient facilities for their proper care are not provided by the authorities, and the Superintendent is practically powerless. I will not trespass upon your time further by enlarging upon this theme beyond saying that from all I can learn the treatment of the poor insane in some of our county homes is enough to "make angels weep"; but will cordially commend to you an admirable and eloquent paper on "The Care of the Insane of our State Outside of the Asylums" by Dr. J. A. Hodges, of Fayetteville, a member of our State Board of Health, published in the Third Biennial Report of the Board, a copy of which I send you.

Wishing you and your Board Godspeed in your noble work for humanity, I am

Very truly yours,
RICHARD H. LEWIS, M. D.,
Secretary N. C. Board of Health.

IN THE MATTER OF DRINKING WATERS.

Private Cisterns in Wilmington.

Application having been made to the Secretary of the Board of Health by the Rev. William McC. Miller, of Wilmington, for a permit to have analyzed by the North Carolina Experiment Station the water of two cisterns in that city, which was suspected of having caused three cases of typhoid fever, the permit was granted and the subjoined letter and analyses followed:

H. B. BATTLE, PH. D.,
Director.

THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION.

Analysis No. 7715. } Duplicate.

RALEIGH, December 20, 1892.

SIR:—The sample of health water sent to the Station for analysis in a bottle marked: "No 1. In back yard at R. W. Hicks', in proximity to sewer-pipes, from cistern," contains:

Total amount mineral matter in solution, grains per U. S. gallon	7.50
Carbonate of lime, grains per U. S. gallon	2.16
Chlorine, grains per U. S. gallon	0.41
Albuminoid ammonia, parts per million	0.230
Free ammonia, parts per million	0.096

Under the circumstances, this water should be condemned at once.

Your obedient servant,
H. B. BATTLE,
B. *Director.*

To REV. WILLIAM MCC. MILLER,
Wilmington, N. C.

H. B. BATTLE, PH. D.,
Director.

THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION.

Analysis } Duplicate.
No. 7716. }

RALEIGH, December 20, 1892.

SIR :—The sample of health water sent to the Station for analysis in a bottle marked : "No 2. In back yard at R. W. Hicks', near stable, from cistern", contains :

Total amount mineral matter in solution, grains per U. S. gallon	8.75
Carbonate of lime, grains per U. S. gallon	2.41
Chlorine, grains per U. S. gallon	0.50
Albuminoid ammonia, parts per million	0.238
Free ammonia, parts per million	0 08

Your obedient servant,
H. B. BATTLE,
B. *Director.*

To REV. WILLIAM MCC. MILLER,
Wilmington, N. C.

NORTH CAROLINA BOARD OF HEALTH,
Richard H. Lewis, M. D., Secretary.
RALEIGH, N. C., December 24, 1892.

REV. WILLIAM MCC. MILLER, *Wilmington, N. C.*

DEAR SIR :—I enclose analyses by Dr. H. B. Battle, Director of the Experiment Station, of the two samples of drinking water for analyzing which I sent you permit sometime since.

The large amount of albuminoid ammonia, plainly of animal origin from the proximity of the sewer and the stable, shows dangerous contamination, and the water should be condemned, absolutely, for drinking purposes at once.

The cisterns should be emptied, thoroughly cleansed and disinfected, and have all leaks stopped before being used again.

Your local health officer, or Dr. George G. Thomas, a member of the State Board of Health, will cheerfully give you specific directions.

Very respectfully yours,
RICHARD H. LEWIS, M. D., *Secretary.*

Water Supply of the Eastern Hospital at Goldsboro.

The following correspondence on this subject explains itself:

THE EASTERN HOSPITAL,
Dr. J. F. Miller, Superintendent,
GOLDSBORO, N. C., December 7, 1892.

R. H. LEWIS, M D.,
Secretary State Board of Health, Raleigh, N. C.

MY DEAR DOCTOR :—Not long since a deep well, 305 feet deep and 6 inches in diameter, was bored at this Hospital for the purpose of securing for our population a good quality of drinking water free from surface percolations, and also for laundry and general ward purposes. The water is clear, fairly cool and pleasant to the taste, but appears to be a little "hard," and our laundry women say it is not first-class "washing water." Being somewhat in doubt as to the quality of this water, and also unwilling that our population shall drink water not known to be of good quality, I send, per your instructions, to-day, two samples of this water to Dr. H. B. Battle, of the Experiment Station at Raleigh, for analysis, which I hope will be both qualitative and quantitative. One sample was taken directly from the well, and the other from a faucet in the Hospital building. I send through you the application to Dr. Battle that you may see what I have to say about the so-called lily and also the moss. There is no admixture of our water—all from deep well—and neither moss nor weeds were ever seen before.

Anything you can do to expedite an early analysis of the water in question will be duly appreciated by

Yours truly and fraternally,

J. F. MILLER, *Superintendent.*

North Carolina Board of Health,
Richard H. Lewis, M. D , Secretary,
Raleigh, N. C., December 14, 1892.

Dr. J. F. Miller, *Supt. Eastern Hospital, Goldsboro, N. C.*

My Dear Doctor:—Yours of 7th inst. came during my absence from home, or it would have been answered sooner.

I have seen Dr. Battle, and he will push the analyses, and hopes to make a report by the end of the week. The Botanist of the Station, though still confined to his room, is well enough to do the work; so please send up as soon as possible the samples of moss and sea-weed,(?) or whatever it may turn out to be, in separate bottles of the water in which they are growing, giving full information as to their location.

Very truly yours,

RICHARD H. LEWIS, *Secretary.*

North Carolina Board of Health,
Richard H. Lewis, M. D., Secretary.
Raleigh, N. C., December 17, 1892.

Dr. J. F. Miller, *Supt. Eastern Hospital, Goldsboro, N. C.*

My Dear Doctor:—I herewith enclose analyses of the two samples of water sent to the Experiment Station. They appear to be practically identical. The indications so far are unfavorable, but I will reserve a final opinion until after the samples of moss and sea-weed (?) found growing therein have been examined by the Botanist of the Station. They have not been received yet. Please send them as soon as possible, and oblige,

Yours very truly,

RICHARD H. LEWIS, *Secretary.*

H. B. BATTLE, PH. D.,
Director.

THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION.

Analysis No. 7718. Duplicate.

RALEIGH, December 16, 1892.

SIR:—The sample of health water sent to the Station for analysis in a glass jar marked, "Direct from deep well at Eastern Hospital," contains:

Total amount mineral matter in solution, grains per U. S. gallon	15.83
Carbonate of lime, grains per U. S. gallon	5.00
Chlorine, grains per U. S. gallon	1.16
Albuminoid ammonia, parts per million	.204
Free ammonia, parts per million	.16

Your obedient servant,

H. B. BATTLE,
Director.

To J. F. MILLER, Sup't. Eastern Hospital,
Goldsboro, N. C.

H. B. BATTLE, PH. D.,
Director.

THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION.

Analysis No. 7719. Duplicate.

RALEIGH, December 16, 1892.

SIR:—The sample of health water sent to the Station for analysis in a glass jar marked, "Direct from faucett," contains:

Total amount mineral matter in solution, grains per U. S. gallon	14.58
Carbonate of lime, grains per U. S. gallon	5.00
Chlorine, grains per U. S. gallon	.83
Albuminoid ammonia, parts per million	.180
Free ammonia, parts per million	.154

Your obedient servant,

H. B. BATTLE,
Director.

To J. F. MILLER, Supt. Eastern Hospital,
Goldsboro, N. C.

THE EASTERN HOSPITAL,
Dr. J. F. Miller, Superintendent.

GOLDSBORO, N. C., December 21, 1892.

DEAR DOCTOR:—I am much distressed over the revelations made by Dr. Battle's analysis of our deep well water. There seems to be some difference in the analyses made at different times—more chlorine and albuminoid and free ammonia in last sample sent. The washerwomen and our engineer (and so think I) say the water is less hard now than it was a month ago; but the analysis shows too much lime and albuminoid and free ammonia. However, first analysis shows 6.25 grains lime to U. S. gallon and the last analysis shows 5 grains. I await further expression of opinion as to effects most likely to result from use of this water. The weed has not been seen, nor moss, in the tank under roof where the sun does not shine upon the water. Nor has any weed been seen in the tank at deep well, but plenty of moss. Both moss and weed can be found in tank on the roof where the water is exposed to the sun. The water in the large tank at deep well is so deep always that it would be difficult to see any weed that might grow on bottom thereof, and weed may and probably is there also, though not visible.

Respectfully,

J. F. MILLER, *Superintendent.*

P. S. No *ice* has been seen this winter in any tank containing our deep well water.

H. B. BATTLE, PH. D.,
Director.
THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION,
Office of Director,
RALEIGH, N. C., Dec. 23, 1892.

1287.

DR. R. H. LEWIS, *Sec. State Board of Health, Raleigh, N. C.*

DEAR SIR:—In reference to the two samples of plants found growing in a tank in a building of the Eastern Hospital, sent by Dr. Miller, Superintendent, I have submitted the same to the Botanist of the Station, Mr. Gerald McCarthy, and I beg to enclose herewith his reply. It would seem impossible for the plants to have come from the deep well. Doubtless the seed of these plants came from the first source of water supply, and were not taken out when the tank was cleaned.

Very respectfully,

(Dictated.) H. B. BATTLE, *Director.*

H. B. BATTLE, PH. D.,
Director.
THE NORTH CAROLINA
AGRICULTURAL EXPERIMENT STATION,
Office of Director,
RALEIGH, N. C.

Dr. H. B. Battle, Director:

I have examined the two samples of vegetation in tank water from Goldsboro. The long grass-like plant appears to be a species of *sagittaria*, a pond weed. The small thread-like plant is a kind of fresh-water *potoneogeton*. a floating aquatic. Both these plants are very common in small ponds and water-holes and ditches. They indicate an impure and stagnant water. They are never found in salt or brackish water. In this case, I presume they grew in the tank where found, and if such water is to be used for human or animal consumption, said tank should get a thorough cleaning and be disinfected with iron sulphate.

The plants have no particular or scientific value, as they can be found in almost every stagnant ditch.

Respectfully,

GERALD McCARTHY, *Botanist.*

North Carolina Board of Health.
Richard H. Lewis, M. D., Secretary.
Raleigh, N. C., December 27, 1892.

J. F. Miller, M. D.,
Superintendent Eastern Hospital, Goldsboro, N. C.

My Dear Doctor:—I enclose letter from Dr. H. B. Battle, Director of the Experiment Station, together with the opinion of Mr. McCarthy, the Botanist of the Station, as to the nature of the plants found growing in the water from your deep well.

As Dr. Battle says, "it would seem impossible for the plants to have come from the deep well," and the opinion of the Botanist as to their nature and usual habitat is confirmatory of that view: but the fact that they were never seen until after you began to use the water from the deep well, and that only, throws doubt on his very natural and proper supposition that "the seed of these plants came from the first source of water supply and were not taken out when the tank was cleaned"—is it not possible that there may be some admixture of surface water by trickling down the outside of the iron casing? Is it possible for the water to be contaminated in the same way from animal excreta? Assuming a negative reply to the latter question, I beg leave to quote from a report of the Massachusetts Board of Health on the "Examination of Water Supplies (1890)," as follows: "Seeking the source of these high albuminoid ammonias we find that, when accompanied with high color, the waters have generally flowed through swampy districts, or have been in reservoirs having vegetable matter on the bottom. Others having less color have had abundant growths of algæ and other forms of life, which in turn depend upon nitrogen obtained from the rain and from organic matter and nitrates brought into the ponds by surface or subterranean streams, or from organic matter in the mud at the bottom. While these large albuminoid ammonias indicate organic matter whose origin is independent of sewage, and consequently is not likely to contain the germs of disease, which are regarded as the most dangerous element of sewage; and while the albuminoid ammonias are, as in all these waters, accompanied by low free ammonias, the organic matter which they indicate may be regarded as in a state not readily susceptible to decay and therefore not dangerous to health, we have yet to recognize the fact that many of these waters, unpolluted by sewage, have at times had bad odors and disagreeable tastes, which have rendered them unsuitable for drinking." It appears also from the same report that the purest of Boston's water supplies had for the two years previous practically the same amount of albuminoid ammonia as Mystic Lake, the worst of the Boston waters and which is known to receive considerable sewage and manufacturing refuse.

Again, it is a well known fact that in former times, in the days of sailing vessels and long voyages, sea captains frequently preferred the highly colored swampy waters for their keeping qualities. So that it does not follow that a water should be condemned on account of a relatively high amount of albuminoid ammonia regardless of its source, although Wanklyn, one of the highest authorities, says that "albuminoid ammonia over .15 per million ought to condemn a water absolutely." It must be borne in mind, however, that the waters he has in mind are those of a densely populated country and therefore much more liable to animal contamination than ours.

Taking everything into consideration—the source of your water supply, the very remote possibility of any animal contamination containing the germs of disease, the fact that it is pleasant to the eye and agreeable to the taste, and the further fact that after several months' use the health of the inmates of your institution has not deteriorated—my opinion is that the water should not be condemned, but with this proviso: that all the tanks be thoroughly cleansed and disinfected with copperas, and all the water used for drinking be filtered. I would suggest a filter of sand and charcoal, so arranged that the filtering material could be easily renewed, as it should be frequently, at least once a week or oftener. Should you adopt this suggestion I would thank you to send two samples of the filtered water, one taken twelve hours after the sand and charcoal have been renewed and the other at the end of one week, duly labeled, to the Experiment Station for analysis. Notify me and I will send you permit for the analyses.

If you should find any, even slightly probable, source of contamination, let me know and oblige,

Yours very truly,
RICHARD H. LEWIS, *Secretary.*

IN REGARD TO THE ADVISABILITY OF ESTABLISHING A QUARANTINE SYSTEM UNDER THE MANAGEMENT OF THE GENERAL GOVERNMENT.

STATE OF NORTH CAROLINA,
Executive Department,
RALEIGH, Dec. 9, 1892.

DR. RICHARD H. LEWIS,
Secretary to State Board of Health, Raleigh, N. C.

DEAR SIR:—By instruction from the Governor, I have the honor to enclose herewith letters from Darwin R. James, Secretary New York Board of Trade *in re* quarantine.

The Governor would take it as a special kindness if you would give him your views on this subject, and its bearing on this State and the Union, so that he can forward the same to the Board as requested.

I am, very respectfully yours,
S. F. TELFAIR, *Private Secretary.*

Rooms of the New York Board of Trade and Transportation,
55 Liberty Street,
New York, December 5, 1892.

A special committee of the New York Board of Trade and Transportation has been appointed, pursuant to resolution, and is seeking information, data and opinions touching quarantine, and the advantages, if any, of establishing a uniform system in the United States, under the management of the General Government; the intention being, if the weight of opinion and evidence favor the proposition, to prepare suggestions for Congressional Legislation on the subject.

The members of the committee are: Chairman, Hon. Oscar S. Straus, (Ex. U. S. Minister to Turkey), of L. Straus & Sons, Importers of China, Glass, etc.; Mr. Jeremiah Fitzpatrick, of J. Fitzpatrick & Co., Importers and Manufacturers of Plate Glass, Looking Glass, etc.; Mr. Edward H. Cole, of The Eaton, Cole & Burnham Co., Well Machinery and Brass Goods; Mr. Elias S. A. DeLima, of D. A. DeLima & Co., Foreign Commission Merchants; Mr. Ambrose Snow, of Snow & Burges, Shipping and Commission Merchants.

The committee have adopted the following line of inquiry, and invite such suggestions and opinions thereon as they may be willing to make public, from experts, and professional men having practical experience of sanitary affairs and from others having opinions on the subject:

1st. Quarantine administration in foreign countries as furnishing precedents for the United States.

2d. The present status of quarantine in the United States: A. *National:* B. *State.*

3d. The existing system of quarantine administration in the United States: A. *Cost;* B. *Restrictions imposed on commerce and travel;* C. *Security afforded.*

4th. A national quarantine: A. *Would it lessen the existing imposts upon commerce?* B. *Would restrictions on commerce and travel be less injurious?* C. *Would it afford increased security to the country?*

Persons writing the committee are requested to affix to their names their professional or special titles, if any, and to address their communications to Hon. Oscar S. Straus, Chairman, 55 Liberty Street, New York, N. Y.

Respectfully, etc.,

DARWIN R. JAMES, *Secretary.*

December 14. 1892.

His Excellency, Thomas M. Holt, *Governor of North Carolina.*

Sir:—In response to your request for my views upon the circular letter of the New York Board of Trade and Transportation in relation to "establishing a uniform system (of quarantine) in the United States under the management of the general government," I would respectfully submit the following brief general statement of them:

In the first place you will please understand that the opinions expressed are personal, and not as representing the State Board of Health, since that body has never considered this question.

Like every other question, it has two sides. Considered solely from the standpoint of the public health of the whole country, I think it not unlikely that a uniform system of quarantine under the control of the general government, with its immense resources, would be more effective than the methods now in use, and, considering the service rendered, more economical, on the well-established principle that the same work can be done more cheaply by wholesale than by piece-meal. But is it necessary? I think not. The instinct of self-preservation, both as to life and trade, on the part of the different States and seaports may, I believe, be depended upon to insure quarantine protection, to all intents and purposes, as effective as is practicable. The very fact that the service is local, that the officials belong to the community most exposed, and are immediately responsible to their friends and neighbors, would probably make them more alert and careful than they might be if they were strangers from a distance. If all officials were entirely conscientious, there need be no fear on this score, but the ordinary principles of human nature obtain among public servants as well as private individuals. One objection to the establishment of a national system is the deadening effect upon local effort in matters of health generally the assumption by the general government of the functions that should be performed by the various States and municipalities themselves would, probably, have, the latter, thus becoming parasites, after a fashion, would, in proportion to their dependence upon a stronger power, become the more enfeebled. Again, in times of special danger, I am confident that the State and municipal health authorities would cordially co-operate, not only with one another, but with those of the United States as well, and the same practical result would be obtained with fewer drawbacks.

Finally, you and I, in common with a large majority of our people, firmly believe that in the centralization of power in the general government lies the greatest danger to our free institutions, and, therefore, as good citizens (and the citizen is not lost in the health officer) we must be thoroughly convinced of the necessity before resigning any of our rights and privileges as States and municipalities. Such a necessity does not, in the matter we are discussing, in my opinion, exist; and, therefore, looking at it from every point of view, and taking everything into consideration, I am convinced that "a uniform system (of quarantine) under the control of the general government" is not advisable.

With great respect, your obedient servant,

RICHARD H. LEWIS, M. D.,
Sec. N. C. Board of Health.

INVESTIGATION AS TO OUR PORT OF WILMINGTON OF COMPLAINT OF THE BRITISH MINISTER AT WASHINGTON THAT VESSELS ARRIVING FROM TRINIDAD AND DEMARARA ARE HARSHLY TREATED AT THE SOUTHERN PORTS GENERALLY.

STATE OF NORTH CAROLINA,
Executive Department.
RALEIGH, December 19, 1892.

DR. R. H. LEWIS,
Secretary State Board of Health, Raleigh, N. C.

DEAR SIR:—I enclose herewith a letter from the Secretary of State, together with a communication made to him by Sir Julian Pauncefote, Minister from Great Britain, and also a copy of my reply.

I would be glad if you will inquire into the matter and let me know what can be done in the premises. Please return the papers enclosed with your reply.

Very truly yours,
THOMAS M. HOLT, *Governor.*

DEPARTMENT OF STATE,
WASHINGTON, December 16, 1892.

HIS EXCELLENCY *The Governor of North Carolina, Raleigh, N. C.*

SIR:—I have the honor to enclose for your information and consideration a copy of a note from the Minister of Great Britain at this capital, relative to the harsh treatment experienced by British vessels arriving from Trinidad or Demarara at the Southern ports generally, and particularly to the refusal of pratique to vessels arriving from May to November with a clean bill of health and no sickness on board.

I have the honor to request for communication to the British Legation your views as to whether it would be practicable for the proper officers of the State of North Carolina to adopt measures productive of amelioration in the future treatment of British vessels.

I have the honor to be, sir, your obedient servant,
JOHN W. FOSTER.

[Enclosure from the British Minister at Washington to the Secretary of State, December 10, 1892.—COPY.]

WASHINGTON, December 10, 1892.

SIR:—Messrs. Whimster & Watson, shipowners of Glasgow, have addressed to the Earl of Rosebery a complaint in regard to the unnecessary application of certain quarantine regulations at Savannah to their S. S., the "*Navigation,*" and to the hardships endured by her crew in consequence. They complain also of of the treatment experienced by vessels arriving from Trinidad and Demarara at the Southern ports generally.

I have the honor to enclose extracts from their letters from which it appears that their S. S. "*Navigation,*" although twice fumigated at Havana, was subjected to two more fumigations at Savannah and put in quarantine for six days, during which no accommodation was provided for the officers and crew on shore. The consequence of their exposure to the night air and rain was that they contracted malarial fever, from which one man died and the whole crew, excepting the engineer, were stricken down during the voyage back to England.

The other complaint is of a general character and has reference to the refusal of pratique to the vessels arriving from May to November with a clean bill of health and no sickness on board.

I venture to draw your attention to the above complaints, in the hope that you may be disposed to bring them to the knowledge of the Governors of the States referred to by Messrs. Whimster & Watson, and that your action may be productive of amelioration in the future treatment of British vessels and their crews by the quarantine authorities at Savannah and the Southern ports in general.

I have the honor to be with the highest consideration, sir,

Your obedient humble servant,
JULIAN PAUNCEFOTE,

THE HONORABLE J. W. FOSTER, etc., etc., etc.

EXTRACT.

Our S.S. "*Navigation*" sailed from Glasgow for Barbadoes, Trinidad and Demarara; thence she was ordered to Havana for orders. Not getting cargo there she was ordered to Savannah to load for Liverpool. On arrival in Havana she was fumigated by the Spanish Doctor, and also by the American Doctor, and for both fumigations the ship was charged. On arrival at Savannah she was put into quarantine for six days and fumigated twice.

* * * * * * * * * * * *

Whilst lying fumigated in quarantine at Savannah, the entire crew and officers had to sleep on deck, exposed to night air and also to rain. The result was, they all contracted malarial fever. Two of them had to be put into the Hospital at Newport News, where the steamer coaled, and on the road home one man died, and every other soul on board, with the exception of the chief engineer, was stricken down by it; fortunately not all at the same time, or the ship would never have reached land.

* * * * * * * * * * * *

Arrivals from Trinidad or Demarara are subjected to five days quarantine at the Southern ports during the months of May to November, although there may be no sickness on board, and although the vessels may have clean Bills of Health. We think that if the Captain presents a clean Bill of Health he should be admitted at once, provided there is no sickness on board. We urge you to endeavor to get some modification of this hardship which ship-owners have to undergo at the hands of the U. S. authorities.

(COPY.)

STATE OF NORTH CAROLINA,
Executive Department,
RALEIGH, Dec. 19, 1892.

To the Secretary of State, Washington, D. C.

SIR:—I have your communication of the 16th of December, enclosing a copy of a communication from Sir Julian Pauncefote, Minister from England, which I have referred to the Secretary of the Board of Health, with instructions to investigate the matter and inform me whether any abuses have been committed at ports of this State, and, if so, to have them corrected, if in their power, and, if not, to advise what legislation is necessary, and I will bring the matter before the General Assembly, soon to convene.

I have the honor to be, very respectfully yours,

(Signed) THOMAS M. HOLT,
Governor of North Carolina.

NORTH CAROLINA BOARD OF HEALTH,
Richard H. Lewis, M. D., Secretary,
RALEIGH, N. C., Dec. 29, 1892.

His Excellency THOMAS M. HOLT, *Governor of North Carolina.*

SIR:—In compliance with the instructions given in your communication of the 19th inst. to investigate the complaints made by the Minister of Great Britain at Washington through Secretary of State Foster in "relation to the harsh treatment experienced by British vessels arriving from Trinidad or Demarara at the Southern ports generally, and particularly to the refusal of pratique to vessels arriving from May to November with a clean bill of health and no sickness on board," I addressed a letter (a copy of which I enclose) to Dr. George G. Thomas, of the Quarantine Board of Wilmington. I beg to hand you herewith his reply, together with a statement from Dr. W. G. Curtis, the Quarantine Physician at Southport.

The members of the Quarantine Board of Wilmington, including the Quarantine Physician, are all educated gentlemen of high character, who are not only interested in the protection of their city and State from the introduction of pestilential diseases, but also in the commercial prosperity of the port. Such being the case, I am sure that they can be relied upon with confidence not to subject vessels of any nationality to harsh treatment beyond what, in certain contingencies, might be unavoidable owing to the lack of proper facilities at the Quarantine Station as set forth in Dr. Thomas's letter, or to unnecessary delay.

With great respect, your obedient servant,
RICHARD H. LEWIS, *Secretary.*

NORTH CAROLINA BOARD OF HEALTH,
Richard H. Lewis, M. D., Secretary.
RALEIGH, N. C., December 20, 1892.

GEORGE G. THOMAS, M. D.,
Quarantine Board Port of Wilmington,
Wilmington, N. C.

DEAR SIR:—In obedience to instructions from the Governor to investigate the complaint made by the British Minister to this country as to "the treatment experienced by vessels arriving from Trinidad or Demarara at the Southern ports generally," I enclose communications from him, United States Secretary of State Foster and Sir Julian Pauncefote, which explain themselves. You will please report at your earliest convenience the facts as to our port of Wilmington, and oblige,

Yours truly,
RICHARD H. LEWIS,
Secretary.

DR. GEORGE GILLETT THOMAS,
Wilmington, N. C.,
December 23, 1892.

DR. R. H. LEWIS,
Secretary Board of Health of North Carolina, Raleigh, N. C.

DEAR DOCTOR:—I have submitted the papers of the British Minister, in which are set forth the complaints of ship-owners concerning quarantine, to Dr. W. G. Curtis, the quarantine physician of the port and beg leave to enclose herewith his reply. In addition to what he has said, let me add that it is a safe rule to follow, that the officer in charge of the Quarantine Station is a better judge of the necessity for fumigation and disinfection of vessels entering the port than the master or owners of the vessels. While it is true that, as a rule, the certificates of Dr. Bergess at Havana are usually sufficiently trustworthy as to make a vessel's claim to free pratique good, it is also true that no conscientious officer can always be guided by this certificate, but must act according to the circumstances and conditions present in each vessel. It is a plain duty of the quarantine officer to protect commerce as well as the port under his charge; but the latter duty is paramount, and hardships that arise in its discharge are unfortunate but unavoidable. I do not believe that any vessel has ever had just cause for complaint of detention or excessive charges at this port. The detention is made as short as compatible with public safety, and the charges at present are ridiculously small. Let me direct your attention to the crying need for an improved service at our Station. At the visit of the State Board of Health to Southport in September last, this was set out for you. Since that time Dr. Curtis and I have made a trip to Charleston, S. C., where we were offered every facility for seeing the workings of the Quarantine Station of that port, and after which we wish to build ours if the Legislature will provide the means. We shall need (1) the ground, situated on a shore near the channel but remote from the passage of vessels generally. This will lead to the building (2) of a wharf, to be gradually replaced by ballast of sand and rock, on which will be placed (3) the houses of the Station, to include a house to hold the disinfection chamber and sulphur furnace, with necessary boilers and engine; a building consisting of two houses separated by covered alleyway, one for hospital for sick and one for the detention of the crew (and passengers, if any), always during the disinfection of the ship, and longer if disease be discovered among the ship's company. Attached to this house must be one for the engineer and such help as may be necessary to properly run the Station. At present it will not be necessary to provide a house for the physician. The disinfection apparatus will include a wrought-iron cylinder, 30 to 40 feet long by 8 feet in diameter, and a carriage to convey the articles for disinfection, which enter the cylinder, by overhead railway. This cylinder must be able to withstand a pressure of ten to fifteen pounds to the square inch of live steam and a heat of 230° F. Also a furnace in which sulphur can be converted into sulphur dioxide, and a fan to propel it through piping to the ship's hold and quarters. Also, of course, a small engine to run the fan and the boilers necessary to generate the heat and steam for the cylinder. Also a tank in which can be stored for immediate use 5,000 to 10,000 gallons of solution of bichloride of mercury 1 part to 1000 in strength. These, with the other smaller accessories, will cost in the neighborhood of $15,000, and it is probable that the fees will run the Station, except the salaries of the officer in charge and the Board of Consultants. It is imperatively necessary that something be done at once for the Station if we propose to combat the dangers of disease next spring, summer and fall, which, according to all indications, will be greater than ever. So far as the national quarantine is concerned I agree entirely with your views, and I am not disposed to put much confidence in its efficiency, if we are to judge by the present relief stations of the Government As far as I am informed there is but one well equipped station under the control of the Government and that is at San Francisco. I know that the arrangements at Sapelo are very poor, and the condition was the same a short time since at Chandelier Island in the Gulf. Besides, it will be at least a year before the transfer can be made and stations built and equipped, and that year is full of danger.

I shall be glad to write you again on the subject.

I am, sir, very respectfully,

GEORGE GILLETT THOMAS.

SOUTHPORT, December 22, 1892.

DR. GEO. G. THOMAS.

DEAR DOCTOR:—I do not quite understand whether I am expected to make any statement or reply to the letter of complaint as to alleged quarantine abuses of Southern ports—the complaint being general as to Southern ports. The port of Wilmington may have been one of them, although it is not specifically mentioned.

I will therefore simply say that nothing of the kind complained of has occurred at the port of Wilmington, and that nothing has been done which could reasonably cause complaint by any person who approves of usefulness in the inspection of ships and their crews, and a regard for the health of our people who *may be* at any time exposed to infection by intercourse with foreign ports.

In my intercourse with the captains of ships I have met with some (very few, I am happy to say) who are pleased with nothing and find fault with everything. These report to their owners a state of things exaggerated in every way, and by their abuse of our laws and regulations make themselves very disagreeable to deal with. I have in my mind at the present time two of these captains, who made many threats, and who might have caused trouble if they had carried out their threats, and their owners had paid any attention to them. Yet these captains were treated with every consideration; there was inspection of their crews and the vessels; their forecastles being filthy, as is usual with all of them, were fumigated; but there was practically no detention, for the ships received free pratique on the same day they entered the port, yet they were not pleased because they did not consider the convenience or safety of our citizens as worthy of their consideration—they simply wanted to do as they pleased.

As to the Savannah cases, which we are not discussing, it may be said that every ship coming from Havana comes with a bad record, and ought to be carefully looked after; and, further, that there is not the slightest probability that the crew contracted their malarial fevers at quarantine, but it is almost certain that they contracted disease after they left quarantine and during their month's stay up the Savannah river.

The Quarantine Board of the city of Wilmington can, and justly does, disclaim any abuses of any kind whatever. They are simply working with limited means to prevent the importation of diseases, and to do it with as little interruption to commerce as possible.

I am much pleased with Dr. Lewis' presentation of the subject of a National Quarantine. It is a scheme for further centralization of power in the general government, and a job for a lot of federal officials who will not be as anxious for the public good as they will be to get their pay; and I see no reason for the opinion that the new batch of officials have more learning or a greater supply of common sense than our own people who love their neighbors and who work for their prosperity.

Very truly yours, etc.,

W. G. CURTIS.

APPENDIX.

OUR PINE FORESTS AS FACTORS OF HEALTH.

Read by S. S. Satchwell, A.M., M.D., before the Medical Society of North Carolina, at Wilmington, May 17, 1892.

The eastern counties of our State present an inviting field of medical research and investigation. Comprising a vast extent of territory, a variety of climate and atmosphere, many species of the vegetable and mineral kingdom, they are covered by fertile fields, rich swamps, extensive plains and large forests of pine trees. This vast extent of territory contains at one and the same time the elements which produce pain, disease and death, and the remedies by which they are relieved and subverted. That wonderful divine, Henry Ward Beecher, said that "among the roots and herbs to be found in nearly every grave-yard there is a remedy, if only ascertained, which would have relieved over half the victims who were laid to rest in death's embrace beneath its green sod." Without commenting on this striking proposition, there are reasons for the opinion that our grand and productive State, in her eastern and western boundaries, contains elements which are susceptible of being made remedies for nearly all the diseases to which our people are liable. As we cast our eyes over our eastern boundaries there is much that is peculiar and of special interest to the medical observer. As the mysterious volume of Nature is opened to us with the laws of health and life written upon its ample pages, we behold, on the one hand, great atmospheric changes between the east and west, the exhilarating properties of our ocean breezes, the moisture of our atmosphere, particularly near the coast, interfering with the functions of the skin and demanding the compensating action of the liver and lung; and, on the other hand, are found, upon our plains, along our streams and in our forests and fertile fields, in rich abundance, the finest specimens of beautiful flowers, medicinal roots and herbs, that adorn the vegetable kingdom, constantly adding to the wealth of the materia medica and to the usefulness of medical science.

Eastern North Carolina can be complimented and congratulated not alone upon her great natural advantages and magnificent resources of minerals, water-power, wealth of climate, lands, forests and adaptation to commerce, manufactures, horticulture and agriculture, but in the way of sanitation, drinking-water, amount of disease, bills of mortality and the general health of our people, we are making great improvement, and may challenge comparison with any portion of our noble old State. Would that I could impress upon every North Carolinian the vast benefit that has accrued to the public health and the public wealth of a *procedure*, potent, talismanic, destructive to disease and efficient to remove causes of disease in all our malarious localities and destined to reduce still more, with the advancing years, the death-rate in all these eastern counties and cities. That procedure is thorough drainage. Large tracts of land, from time immemorial hot-beds of malaria and the homes of disease and pestilence, have become, by this agency alone, the abodes of health, comfort and happiness. Every year do we see effectual drainage routing this fell destroyer of our race from his old accustomed haunts and dislodging him from his strong entrenchments in the east, until it stands out as a beacon truth in the light of sanitary science that malarious diseases, in their numerous phases and changing aspects, are passing away as the years roll on.

But these diseases and their varying complications and grades are not destitute of interest still to the physician, as the changing seasons of wet or dry, cool or hot, and other atmospheric varieties, render different communities more or less sickly. Malaria still abounds in different places as the conditions are favorable to its production, now manifesting itself in one form and then in another—sometimes intercurrent with some other disease more or less marking its features, and then assuming the shape of another malady, not always easy to diagnose and cure. It still prevails extensively, finding victims in every direction, and in every favoring locality visiting its effects upon our patients and ourselves. This invisible, *imponderable*, and yet positive agent of disease, is borne still, as in ages past, upon the wings of the morning breeze, the evening mists and nightly vapors entangle it in their meshes, and the fragrant odors of spring are treacherous with its poison

My main object, however, in this paper, is to present the merits and claims for health, in other respects of a very large portion—more than one-half, perhaps, of the east—in the beneficence of Nature alone. I allude to the antiseptic, hygienic and preventive properties of our eastern pine tree, or the exemption of our pine forests from consumption, malaria and germ diseases. For more than three decades I have been continuously engaged in laborious country practice in our eastern counties, comprising every variety of malarious locality, whether productive of the milder forms of intermittent and remittent fevers or of the higher grades of malarial fevers as seen in severe congestions and hæmorrhagic malarial fever. I have also practiced extensively during all this time upon the pine ridges and in the pine forests of numerous of these eastern counties, especially east of the Wilmington and Weldon Railroad and between Virginia and South Carolina. I have to record as the result of a long and arduous practice, based upon my observation and experience, that, while malarial diseases and their complications with other diseases are peculiar and indigenous to malarious localities, sandy regions, abounding in pine forests, are exempt from malaria, from the production of consumption, diphtheria, puerperal fever and diseases of almost every class that are due to bacterial infection. I do not say that consumption and diseases of germ origin do not occur at all where pine forests abound, but my experience is that they are of very rare occurrence.

Look at the tall pine tree of our eastern plains and sandy soil with its absorbent powers. Its tall, columnar trunk offers less mechanical obstacle to the passage of air, and a smooth surface for the concentration of dews and vapors than any other tree of the woods. But it seems gifted with singular salubrious powers, and imbued with healing virtues and antiseptic properties in every bough. Every tree of the forest circulates, secretes and eliminates, as long as alive, its specific and peculiar effluvia. The pine has its ozone. Though no chemical analysis has been made of its exhalations, it is reasonable to conclude that they may possess certain unseen virtues, specific chemical properties and affinities which may enable them to mitigate, neutralize, decompose or render inert malaria, the bacillus of consumption and the micro-organisms of other diseases.

Physicians and laymen alike contend for the hygienic and health-preserving properties of the piney woods of our eastern counties and of the piney sections of our Atlantic slope. They ascribe to the presence of our piney forests the proverbial and remarkable exemption of the inhabitants of this vast extent of territory from malarious diseases, from consumption, from puerperal fever, from continued fevers, diphtheria and other diseases originating from the presence of germs. The fact that piney regions of country are healthy is proverbial and traditional, established beyond cavil or dispute.

It is true that good drinking-water is almost always found in piney lands, and this may have some causative action in producing the healthfulness of our piney sections. It is true that the soil of pine forests is generally sandy, and its capacity and powers to absorb, not alone malaria, but bacterial germs, as they float in the air, may have some relation to this healthfulness. But that, above and beyond all this, there is a *something* in the pine tree that is antidotal to malarial poison, antagonistic and hostile to the causes of other fevers, to puerperal fever, to diphtheria, to septic infection and blood-poisoning, and germ disease generally, is a well-established truth of observation and experience.

Although these sanitary facts as to the pine tree are treated with strange indifference and neglect, both by the medical and non-medical public, the subject is by no means new, illustrating that when we look into the history of almost any subject how little there is new in its facts and its phenomena. What is new consists in our manner of regarding them, our comprehension and application of them.

The pine and its preparations have been long regarded as hygienic and curative, but as especially remedial in the antiseptic treatment of pulmonary diseases. The adoption and success of antiseptic methods of treatment of pulmonary affections have been recorded again and again, and as often have met with opposition, because the treatment has often been held to be empirical. But long experience and faithful investigations have reduced it to a more scientific basis. The antiquity of the fact of the antiseptic treatment of pulmonary disease in the way of tar vapors dates back to the days of Hippocrates and Galen. Galen advised consumptive patients to settle in the vicinity of Vesuvius and Ætna, and to inhale sulphurous and tar vapors and sea air. It is a noticeable fact in the history of pulmonary therapeutics in the last hundred years the frequency with which tar vapor has been advocated as of great value in the treatment of lung disease. Dr. Rush, of Philadelphia, in 1787, Dr. Beddoes, of England, about the same time, and Sir Alexander Chrichton, about the same time, all stated that they had met with great success in treating consumption by the inhalation of the vapor of boiling tar. Since the time of Hippocrates and Galen other illustrious physicians, Skoda and others, have used the inhalations of the vapor of tar and turpentine with much success in phthisis, pulmonary gangrene, and in bronchial troubles and catarrhal affections of the air-passages. Its application has often failed because of the useless attempt to test any method of treatment in cases of advanced phthisis. No line of treatment will be effective in causing suppurating cavities to close up and heal, or is competent to replace lung tissue that has been destroyed by progressive ulceration and disintegration. Hundreds of cases of consumption are daily coming before us already in this State. That is why so many advanced cases die who go for relief to the piney lands of Florida and other States.

Coming down along the line of inquiry from the days when Rush and Skoda and the earlier physicians used the vapor of tar and turpentine as a remedy, to more recent times, let us see if experience now teaches that pine forests and preparations and extracts from the pine tree have an influence in sterilizing and destroying and neutralizing miasmatic emanations, germs and microbes. Whenever a turpentine still is in active operation, we find an agency at work which is inimical to miasma and to living germs and microbes. Localities and places sickly previous to the erection and operation of one or more turpentine stills have been subjected to such atmospheric changes and sanitary improvement as to become healthy. When the turpentine stills have ceased to be used the former unhealthiness of the localities has generally returned, favoring the belief that the process of distillation of the spirits from the crude turpentine is sanitary. Likewise persons of weak lungs who habitually work around, and in immediate proximity to, turpentine stills while this distillation is going on, generally improve in their pulmonary troubles and in their general health.

We learn by observation of the health-giving properties of the pine tree as it abounds in the sandy regions of the Atlantic slope of North and South Carolina. The inhabitants are taught by experience that if they remain during the warm season upon the sounds, bays, creeks, rivers and other low places that are liable to malaria and zymotic causes of disease, they are apt to be sickly. As a consequence we find them inclined to remove during the sickly season to the higher regions of the pine, and that in so doing they are generally exempt from malarial and typhoid diseases and affections caused by micro-organisms. Farmers and others who reside near the coast of our own State and that of South Carolina are familiar with these significant facts and profit by them when they are able to do so. The intelligent farmer who clears his swamp land and cultivates his low-land farm knows that he is in danger of sickness if he constructs his dwelling in the same place and inhabits it, and hence he chooses some elevated pine ridge as his residence, with the air and drinking-water purified with the emanations from the surrounding pines. The great work of sanitary progress in the way of better drinking-water, more efficient drainage and purer air that is going on in our State, is steadily *preventing preventable* causes of disease and lessening our bills of mortality.

It deserves to be repeated, with emphasis, that in the piney belts of North and South Carolina diphtheria, typhoid and malarial fevers, puerperal fever, and the whole class of zymotic diseases are extremely rare. I cannot say positively that the peculiar exemption of these extensive piney belts from these diseases, including consumption, is due to the pine tree, but it is a fact beyond dispute that where the turpentine tree is abundant certain classes of diseases, such as consumption, malarial diseases, diphtheria, puerperal fever and other affections due to bacterial infection or to the presence of germs and microbes, are of very rare occurrence. Why this is so remains to be discovered by the investigations of some scientific germs. As to the remedial effects of turpentine in diseases of the class mentioned, our experience and that of every observant physician will bear testimony to its admirable action. Its daily increased use by the profession in this class of diseases everywhere, and its traditional use for ages, both internally and externally, bear strong testimony of its worth. For external use for cuts and wounds I know of no remedy its equal. I have often seen the fresh gum from the turpentine boxes applied to cuts, and always with the happiest results. The application of the strong spirits to the diphtheritic throat destroys the membrane as I have never seen it done by any other application. Whether its beneficial action, administered externally or internally, does not depend upon its adaptation and power to sterilize and destroy bacterial germs and living organisms, as they exist in cuts and wounds, and upon internal surfaces when typhoid fever assails a patient, for example, or when the poison of miasm sets up bilious fever in the system, may well be a matter of enquiry.

Another peculiarity of the piney belts is their exemption from the septic poisoning, gangrene and erysipelas, of wounds and surgical operations. During my professional life I have frequently been called upon to perform important and unimportant surgical operations, as my country practice has extended to piney woods sections. In no operation that I have performed in the piney woods, or amputation or wound that I have treated in a piney belt, have I had to combat pyæmia, septicæmia, erysipelas or gangrene. The purity of the air of the piney belts seems to favor surgical treatment in every respect. If city hospitals, infirmaries, alms-houses and other places for the treatment of medical and surgical cases could be changed from cities and towns and other localities where the air is not good to the antiseptic influences of pure air and piney communities, they could be managed more successfully and with less mortality. My observation and experience as a surgeon during the late war, in charge of a hospital most of the time averaging from three to four hundred sick Confederate soldiers, gave me valuable lessons and impressive memories all along this line.

It may be well just here to remark that outside of our piney sections nearly all of our diseases are more or less malarious the year round, and are disposed to be periodical, demanding quinine. For several years we have had less of malarial disease and more of typhoid, though the typhoid fever of the east does not seem to prevail so extensively as it does in the west, and is of a milder and less fatal form. It deserves to be remembered that in our eastern counties and towns we sometimes have, in the same case of sickness, two different poisons and causes of disease operating at the same time. In all such cases this coexistence seems to modify the action of each, produces a milder type of fever and a variety of treatment to correspond with the periodicity and other characteristics of each particular case.

And now let us briefly apply the statements, views and reasoning of this paper to the great practical and important question of the health and resources of health of eastern North Carolina.

Looking, in the first place, at the malarious localities of the east, we find that malaria has been steadily but surely giving up its intrenchments and strongholds for a number of years under the influence of drainage and other sanitary measures. With this disappearance of malaria and of the causes of typhoid fever as well, under the operation of preventable and removable means antagonistic and destructive, too, of typhoid poison, there has been gradually going on in the east less and less of malarial and typhoid fever. So that, in relation to these diseases alone, the public health in eastern North Carolina has greatly improved and is steadily improving. With the system of sanitation now at work in all our eastern towns, counties and cities, there is every reason to believe that the whole family of malarious and typhoid fevers will steadily decrease and will be eventually unknown. But be it remembered that a very large portion of the east abounds in pine trees and is covered by the piney belts, that are remarkably exempt from disease. The piney sections embrace a large portion of the east from the coast to near Raleigh and Fayetteville, and higher up, and from Virginia to South Carolina. Within this vast area of piney land it is likely that there exists *one-half* or *two-thirds* of eastern North Carolina. It is held to be almost wholly exempt from malarial and typhoid causes of disease, from diphtheria and zymotic diseases and other affections arising from germs and microbes, upon the ground that these diseases do not find a congenial home in our pine forests. If the observations and experience of physicians and laymen all along these lines are to be regarded, there is no portion of North Carolina more healthy than the east. Our statistics of health, longevity and bills of mortality will sustain this view. And yet in this important relation great injustice and very great wrong has been done the east, with its fertile lands, magnificent forests, abundance of mineral resources and wealth of climate. It is time that truth should prevail, that erroneous views should be corrected in regard to the great attractions and unrevealed advantages of the east. Laborers and men of skill and capital in other States and across the ocean, seeking new and healthier homes with more inviting fields of enterprise and investment, have long been deceived and blinded by misapprehensions and false statements bearing upon these grave interests. The incontrovertible truth has been suppressed and withheld from other States and other countries that no healthier homes can be found than throughout eastern North Carolina and no portion of earth where the soil is more generous and where Nature has been more bountiful and magnificent in all those gifts which contribute most to the comfort, prosperity and happiness of man.

But certain causes have operated against the development and utilization and appreciation of our health benefits and other great things which kind and generous Nature has done for our eastern people—one is the great objection of capital to invest where the ignorant negro vote is overwhelming and where taxation is at the disposal of ignorant suffrage. And here is an argument for popular education strong, binding, invincible and paramount. Another is the wide-spread misapprehension which exists in regard to our sanitary condition, our drinking water, our climate and other health benefits. As already said, the observation and experience of physicians who have practiced in our reclaimed and well drained swamp lands and piney belts will bear out the statement that, even admitting the presence of malaria, typhoid fever causes, and zymotic diseases in these localities, they are less severe in form, far more amenable to treatment and less fatal than in the hilly and mountainous regions of our State. That while it is the boast that the higher altitudes of the west produce specimens of more robust physical stamina, medical observation and experience justify the statement that in the matter of health and longevity the east will compare favorably, not alone with the west, but with almost any part of the American continent. It is not unlikely that climatic changes in the east have been going on for a number of years that have combined with other causes in improving its sanitation and in rendering the entire East more salubrious. The existence of a semi-tropical climate along our North Carolina coast, embracing pine forests, at the mouth (extended) of the Cape Fear River, as shown by the thermometer and vegetable growths, recommends this section eminently for health and as suitable for a sanitarium as higher altitudes, especially for pulmonary complaints.

One great obstacle to development and progress in the East is the failure of our own people to appreciate our soil and climate and to place a just estimate upon the precious gifts and manifold blessings which Nature has so richly spread before us, including that of health. Where Nature has done the most for man, there man has done the least for himself. The proverbial ignorance and indolence of our people render them insensible to enterprise, dormant and indifferent to immigration of capital and suitable labor. We lie supinely upon our backs and wait, in contentment, for others from abroad to stimulate us to effo t, and to come and tell us what to do and how to do it. Our hope is in the infusion of new blood and better methods that will reclaim our farms, utilize our forests, erect more manufactures, build up schools, churches, towns and cities, people our railroads.

DISCUSSION.

Dr. Haigh thought it was his duty to bear witness to some of the facts brought out in the paper. We have all along the line of this country been too quiet and entirely too modest in regard to the health-giving properies of our climate. All through this middle country of eastern North Carolina, where in years past malaria existed so extensively, the change has been simply marvelous. He spoke of the severity and fatality of the bilious fevers that were so common at the time he began to practice medicine, about forty years ago, saying they were nearly as malignant in some cases as yellow fever. Now it is a rare thing to have bilious fever. We have the mild forms of intermittent fever and what he calls intestinal fevers, for they rarely reach the type of typhoid. He said our climate is inviting to those seeking health. He was glad the doctor brought forth the virtues of the pine. It is especially useful in irritation of the mucous membrane of the bowels. During the war we had to depend upon it to a very large extent, using it both externally and internally in mucilaginous drinks, and since then some of the worst forms of low fevers have been entirely relieved by the use of oil of turpentine. There is one point on which greater stress should be laid—it is the system of drainage in the eastern part of the State, which has greatly improved. For a long time the people of the hill country have been afraid to come to the low country for fear of having fever, while we think it is sometimes more dangerous to go to the high country. He thinks we have as healthy a country as any part of the State; we are more free from violent disease. We ought not longer to allow the stigma under which we have rested so long. He was not prepared to indorse what the doctor said in regard to diphtheria. He does not fully understand the nature of the disease nor what causes it. He does know that in certain regions where there was no manner of filth, where everything was as clean as possible, and the water perfectly pure, and the air was filled with the perfume of the pine, he has seen some of the worst cases of diphtheria he ever encountered He has never been able to satisfy himself that it is a filth disease; as other diseases, it is possibly intensified by the surroundings as found in large cities.

Dr. Potter thought he could give some practical demonstrations of the healthfulness of the pine forest. Anterior to the late war the farmers living near the watercourses were in the habit of moving up into the higher pine regions on the approach of summer, and they rarely suffered from malaria. He cited the case of a man who thought he might do just as well if he remained in his winter home in the lowlands. He tried it for two summers, and during those two years lost three of his family. He thought we seldom have a genuine case of typhoid fever. He has seen diphtheria in the highest pine regions where he could see no cause for it, but where the disease seemed almost to originate *de novo.* He mentioned an epidemic that started in the barracks in a small town where he was in charge as surgeon. On searching for the cause he found under one of the platforms connected with the building a reeking cess-pool. As soon as this was cleaned there were no more cases of the disease. This outbreak seemed to have a cause in this cess-pool.

SOME REMARKS RELATIVE TO THE STATE BOARD OF PUBLIC CHARITIES AND COUNTY CHARITABLE AND PENAL INSTITUTIONS.

By William H. Cobb, Jr., M.D., Chairman of Section of State Medicine and Medical Jurisprudence.

(Read before the Medical Society of North Carolina, at Wilmington, May 18, 1892.)

Mr. President and Gentlemen of the Medical Society of the State of North Carolina:

Great and growing have been the demands requiring the permanent establishment and maintenance of a State Board of Public Charities, and its supervision in a general sense over all penal and charitable institutions in the State; and it is indeed gratifying to know that we can now point with pride to such an organization, and feel that through these trusted agents, safeguards of mercy and justice, our poor and afflicted will be kindly dealt with and shielded from all harm, and our criminals will not be abused, but shall be protected and humane consideration vouchsafed unto them.

Irregularities, mismanagement and abuses will creep into public institutions of every country. North Carolina is no exception to this statement; nor are we as a people more prone to these ill uses than our neighboring States; but human nature is very much the same the world over, and the "flesh is weak" when subjected to temptations.

North Carolina, ever foremost in good works and noble deeds, and early recognizing the necessity for State supervision in the control and management of all charitable and penal institutions within her borders, was not slow to make provisions whereby this object might be attained, and in Article II, Section 7 of our State Constitution we have the authority for the establishment of a Board of Charities, "to whom shall be entrusted the supervision of all charitable and penal institutions, and who shall annually report to the Governor upon their condition, with suggestions for their improvements." It was not, however, until 1869 that the General Assembly "proceeded by concurrent vote to select five electors, who shall be styled the Board of Public Charities of the State of North Carolina"; and at one time so much authority was vested in this organization that no change could be made in the management of State institutions without the advice or consent of this Board; but this act has been repealed, and wisely so, I think, as its enforcement could not but engender dissatisfaction, but would necessarily produce a division of authority.

The history of the existence of this Board of Charities, in its labors of love and efforts for the amelioration of suffering humanity, from its first organization until now, would be but the portrayal of a struggle for life under great disadvantages and almost insurmountable difficulties, with but little manifestation of appreciation by our lawmakers, and with very little assistance and co-operation from the people at large. It would be but the repetition of known facts and a trespass on your valuable time were I to attempt to recount the many trials encountered and the signal failures made in trying to accomplish the purposes for which they were created, all because they had not the funds necessary to meet absolute expenses in carrying on their work. These facts and others pertaining to this subject were most graphically set forth in an able paper by Dr. K. P. Battle, Jr., read before the Society at its annual meeting at Elizabeth City, in 1889.

Suffice it to say that, though having to labor under adverse circumstances, it still exists, and is to-day an honor to our State, and has accomplished more this year than ever before in the history of its existence.

Heretofore the Board was empowered to meet four times annually, viz: in January, April, July and October, and if it was deemed proper and necessary, more frequently, and yet provision was made for payment of expenses of only one annual meeting; but the last General Assembly, evidently appreciating more fully the responsibility of their labors, repealed these restrictions, and members are allowed their actual expenses for each and every meeting, and as a great deal of work falls upon the shoulders of the Secretary, he is allowed compensation for the time actually engaged in attending to the duties of his office and the cost of all stationery used.

While probably it was contemplated that they would meet quarterly, it is now quite likely that only semi-annual meetings will be necessary, unless the development of unexpected causes should require more frequent sessions, which of course will be regulated by members of the Board

The Board of Charities, in obtaining the desired information, have adopted an admirable method whereby they can learn directly of the condition and management of institutions under their surveillance, and that is by sending out the following notice to different gentlemen in the various counties who are known to be men of good standing and excellent character, asking their co-operation and assistance in acquiring the needed information:

"Dear Sir:—In pursuance of authority vested in the State Board of Public Charities to inspect the several penal and charitable institutions throughout the State, by the members of said Board, or 'otherwise,' it has been determined by the Board that the most effective method of proceeding would be the organization of visiting committees of three citizens in each of the counties of North Carolina. To this end the Board asks the co-operation of humane and patriotic citizens to assist in the effort to ascertain the condition and management of all jails, poor-houses, work-houses, etc., in each county. No compensation is proposed for this service. It will not be requested of any but citizens of high character and public spirit, who will be willing at certain periods to visit the institutions named, and exercise a moral supervision over their conduct and operations. Will you kindly accept this charge for your county? It is proposed to forward to you blanks with suitable inquiries, to be answered by the officials in charge, and returned to this office. These will be of great value in ascertaining the true condition of the institutions named within the State.

"It is not believed that the moral effect of personal visits from influential citizens in each county can be surpassed by any other form of inspection or superintendence.

"The Commissioners of Public Charities receive no compensation for their own services, and therefore consistently ask the aid of their fellow-citizens in a duty imperatively needed in our midst. It will be perceived, on reflection, that no board of a limited number could adequately perform it in person; nor could the work of paid officials (even if there were funds appropriated for said purpose, which is not the case) be comparable with the labors of public spirited citizens inspired by pity for the unfortunate and patriotic devotion to the best interests of the people.

"If you will accept the charge in behalf of your county, please sign and forward the enclosed postal card If your engagements do not permit you to accept this position, will you kindly forward to the Board the name of some citizen whom you will suggest, and who could probably serve?"

[Signed by the Secretary of Board of Public Charities.]

Having secured the services of the desired number of citizens, blanks containing the following questions relative to the "homes for aged and infirm" (formerly "poor-houses") and work-houses and jails are forwarded them to be properly filled out and returned to the Secretary of the Board, as indicated in the notice of instructions they receive:

1. Please state the situation of the "Home for the Aged and Infirm," and how far from the county-seat.

2. Give the number of buildings, size of each, and state of what material built.

3. How many rooms in each building?

4. How are the buildings ventilated?

5. What are the means of protection?

6. How is the supply of water furnished for drinking, cooking and bathing purposes?

7. How are the buildings heated in winter?

8. How many inmates can be comfortably accommodated with the present arrangements?

9. How many are now in the care of the institution?

10. How many of these are able to work?

11. How many are helpless or bed-ridden?

12. How many are in voluntary confinement?

[*Note.*—If any work-house is attached to the Home, please give all particulars that would correspond with these questions under "Remarks," or on a separate sheet]

13. Please give the names of such persons belonging to the Home as are under involuntary confinement, stating if insane, imbecile, or idiotic, here or on list attached to this report.

14. What is the amount and kind of food allowed daily to each inmate?

15. What is the average weekly cost of maintenance of each inmate?

[*Note.*—If this question cannot be answered, for any reason, please give the aggregate cost annually to the county for three years past, with the average number accommodated, if practicable.]

16. State if any veteran soldier is an inmate of the County Home, and if so, please give name, regiment and company, and whether in receipt of pension or not.

[*Note.*—This is not for publicity, but the information is requested for the benefit of the veterans.]

17. What is the name and postoffice address of the keeper or overseer of the Home?

18. What pay does he receive, and is his compensation in money altogether, or are there any perquisites?

19. Is he industrious, sober and discreet?

20. What is the name and address of the physician who attends the inmates?

21. What does he receive for his services?

22. How many inmates were in the Home on December 1, 1891?

23. How many admitted since that time up to March 1, 1892?

24. How many deaths during that period, and from what diseases?

25. How many discharges from other causes?

26. How many inmates assist in any part of the farm or garden work?

27. How many could be employed in any light work for their comfort or pleasurable occupation and the benefit of the Home?

28. If any could do some light work, such as the making of small articles, what do you recommend, and what amount of means, if any, would be required to start and maintain the same?

29. Give a general description of the premises. Are they well arranged, neat and in good condition, or dilapidated and out of repair?

30. How many acres of land belong to the Home (formerly known as the "Poor-House Tract"), and what is the quality of the land?

31. How much is in cultivation, and what stock is kept?

32. What crops are raised on the land, and how are the products used?

33. What vegetables are raised for summer and winter use?

34. Are houses and yards protected by shade-trees?

35. Are the ashes and manures saved and used in improv-

ing the land, or any green crop of peas or clover turned under for that purpose?

36. Is any provision made for religious services on Sunday, or any other day? If so, to what extent, and by whom?

37. Are there any children in the Home? If so, why? If any of these are capable of taking care of themselves now, or soon, have any steps been taken to assist them, or to place them in orphan asylums, or private homes?

38. Has any punishment been inflicted upon any inmate since admission? If so, upon whom? By whom? What punishment, and for what offence?

39. Is there any system of out-door relief to the poor for support in your county?

40. If so, how many persons are thus supported, and at what average rate?

Remarks.

[Left blank for any additional information.]

QUESTIONS CONCERNING PRISONERS AND PRISONS.

1. Of what material is your county prison built?

2. Is it fire-proof?

3. What means are there for extinguishing fire?

4. What is the size of the building?

5. How many stories high, and how many rooms or cells for prisoners?

6. State the size of the rooms or cells and number placed in each.

7. Are the windows closed or in any way obstructed? If so, how and why?

8. Are there any means of ventilation except by the windows?

9. What are the means of heating the building in winter?

10. Are the prisoners subject to much suffering in cold weather?

11. What amount of bedding and covering is allowed, and is furnished to each prisoner?

12. What part of the prison is occupied by the male, and what part by the female, prisoners?

13. How often is cool drinking-water furnished during the day?

14. What is the daily allowance of food to each prisoner?

15. What means are used to preserve the cleanliness of the jail?

16. What disposition is made of the excrement?

17. Is the prison free of vermin? If not, what steps have been taken to secure that result?

18. Has punishment been inflicted on any prisoner since confinement? If so, upon whom? By whom and by what authority? What punishment and for what offence?

19. Are the prisoners allowed to have intoxicating liquors?

20. Do the prisoners receive any ministerial services on Sunday, or at any other time?

21. Please give the number, color and sex of prisoners now in confinement; also offence, and date of confinement, and term if sentenced.

22. Please give the number, color and sex and offence of all prisoners under confinement from December 1, 1891, to March 1, 1892.

23. How many deaths during the period above named, and from what cause?

Remarks.

[Left blank for any additional information.]

Unfortunately for the ultimate purposes desired, I am informed that there is a feeling of indifference, if not antagonism, manifested by some of the County Commissioners and Superintendents of Health, upon the grounds that these "vigilant committees" of citizens, if I may be pardoned for terming them such, are in a measure usurping their work and transcending their authority. Now, never was there a graver mistake made, for the sole purpose and object of these citizens is to ascertain all the facts relative to the care and management of the charitable and penal institutions, and act in conjunction with the regular authorities in bringing about a better condition of affairs generally, and abolishing any and all irregularities that may be found to exist. It is always known by the superintendents of these institutions when they may expect a visit from a committee of the Grand Jury or the County Commissioners, and any abuses or irregularities, if such did really exist, could be easily suppressed or hidden from view during these short, superficial and oftentimes imperfect examinations; whereas this tendency is in a great measure overcome by the unexpected and assiduous visits from one or more of these officially appointed citizens.

In many of our county institutions a comparatively good system of management prevails, the patients are supplied with proper diet and suitable clothing, but there are many, and I fear they are in the ascendancy, where nothing but the poorest and coarsest food is provided, and almost no attention paid to its preparation and variation, and the inmates clothed with the scantiest of garments consistent with decency and civilization.

In this connection it seems to me greater good could be accomplished and better results obtained, if more care was paid to these vital necessities. Another matter deserving of great attention is the personal and general hygiene of these unfortunate beings, for if "cleanliness be next to Godliness," then there are many of them, I fear, who, if they ever possessed any of the divine in their nature, cannot now lay claim to that attribute.

In visiting a County Home on one occasion, I was very forcibly struck with one of the inmates, whose appearance was repelling from the large amount of "real estate" he carried on his person, and propounding a question as to the frequency of his bathing, he informed me that "he washed about once a year." And this, too, not far from many of our homes, and in this century of enlightenment and civilization. Gentlemen, is there not great need for improvement and a systematic supervision in some of our institutions? In a Home of one of our western counties there is confined a lunatic, "harmless and incurable," who, under the influence of her delusions, is guilty of incoherent actions and language, and to correct this woman she is whipped or thrashed by the authorities of the place as though responsible for her actions caused by a diseased mind. This case, I am gratified to say, was brought to the knowledge of the Board of Public Charities through a member of the "Citizen Committee," and steps were immediately taken to prevent the further perpetration of this outrage upon an unfortunate woman devoid of reason; and yet, I dare say, 'twas done through ignorance and not with the intention of maltreatment or cruelty. Other incidents might be cited showing the necessity for better and more intelligent management of these institutions, but it is not necessary.

Before concluding this subject there is a suggestion which I wish to make relative to the county criminals and their employment on the farms in connection with the County Homes.

All of us recognize the necessity for the establishment of work-houses in every county within our State, and my suggestion would be this, viz.: Have each work-house established in close proximity to the "Home for the Aged and Infirm," both under the management and supervision of one superintendent, and let all criminals sentenced to terms of imprisonment for ten years and under be sent to these county work-houses, and under the security of guards made to labor on these farms, and thus be a source of revenue to the county, in that their labors support the county poor, and in a great measure make the work-house and Home self-sustaining.

Several counties within the State have established work-houses and derive a great deal of service from the labors of their inmates, many of the convicts being used in improving public roads, but it seems to me preferable that they should be made to work on the farms, and thus be self-sustaining and support the poor and afflicted inmates of the Homes, a great majority, if not all of them, being unable to do manual labor, save of the easiest kind.

In conclusion, I shall indeed feel gratified if these incidental observations shall bring more forcibly to your minds as physicians the necessity for improvement in the management of these institutions, and elicit your hearty co-operation and influence in behalf of any agency which has for its ultimate purpose the accomplishment of this object.

FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1893-1894.

RALEIGH:
JOSEPHUS DANIELS, STATE PRINTER AND BINDER.
PRESSES OF E. M. UZZELL.
1895.

FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH,

1893-1894.

RALEIGH:
Josephus Daniels, State Printer and Binder.
PRESSES OF E. M. UZZELL.
1895.

MEMBERS OF THE BOARD

ELECTED BY THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

George Gillett Thomas, M. D., President .... Wilmington.
Term Expires 1897.

S. Westray Battle, M. D. .... Asheville.
Term Expires 1897.

W. H. Harrell, M. D. .... Williamston.
Term Expires 1895.

John Whitehead, M. D. .... Salisbury.
Term Expires 1895.

APPOINTED BY THE GOVERNOR.

W. H. G. Lucas, M. D. .... White Hall.
Term Expires 1895.

W. P. Beall, M. D. .... Greensboro.
Term Expires 1895.

F. P. Venable, Ph. D., F. C. S. .... Chapel Hill.
Term Expires 1895.

John C. Chase, Sanitary Engineer .... Wilmington.
Term Expires 1895.

Richard H. Lewis, M. D., Secretary .... Raleigh.
Term Expires 1895.

STANDING COMMITTEES.

Epidemics—Drs. Lewis and Whitehead.

Water Supply and Drainage—Dr. Thomas and Mr. Chase.

Hygienics of Public Schools—Drs. Whitehead and Lucas.

Climatology—Dr. S. W. Battle.

Adulteration of Food and Medicines—Prof. F. P. Venable.

Sanitary Condition of State Institutions—Drs. Harrell and Beall.

Vital Statistics—Drs. Lewis, Thomas and Harrell.

LIST OF COUNTY SUPERINTENDENTS OF HEALTH IN THE STATE OF NORTH CAROLINA, DECEMBER 31, 1894.

Alamance—Dr. R. A. Freeman, Burlington.
Alexander—Dr. R. B. Killian, Taylorsville.
Alleghany—Dr. C. G. Fowlkes, Topia.
Anson—Dr. E. S. Ashe, Wadesboro.
Ashe—Dr. L. C. Gentry, Jefferson.
Beaufort—Dr. John C. Rodman, Washington.
Bertie—Dr. H. V. Dunstan, Windsor.
Bladen—Dr. Newton Robinson, Elizabethtown.
Brunswick—Dr. D. I. Watson, Southport.
Buncombe—Dr. H. L. Baird, Asheville.
Burke—Dr. J. L. Laxton, Morganton.
Cabarrus—Dr. Leona M. Archey, Concord.
Caldwell—Dr. A. A. Kent, Lenoir.
Camden—
Carteret—Dr. George N. Ennett, Beaufort.
Caswell—Dr. W. O. Spencer, Yanceyville.
Catawba—Dr. J. M. McCorkle, Newton.
Chatham—Dr. L. A. Hanks, Pittsboro.
Cherokee—Dr. J. F. Abernathy, Murphy.
Chowan—Dr. R. A. Winborne, Barnitz.
Clay—Dr. W. E. Sanderson, Hayesville.
Cleveland—Dr. O. P. Gardner, Shelby.
Columbus—Dr. I. Jackson, Whiteville.
Craven—Dr. Leinster Duffy, Newbern.
Cumberland—Dr. J. H. Marsh, Fayetteville.
Currituck—
Dare—Dr. W. H. Peterson, Manteo.
Davidson—Dr. R. L. Payne, Jr., Lexington.
Davie—Dr. James McGuire, Mocksville.
Duplin—Dr. W. P. Kennedy, Warsaw.
Durham—Dr. John M. Manning, Durham.
Edgecombe—Dr. Donald Williams, Tarboro.
Forsyth—Dr. D. N. Dalton, Winston.
Franklin—Dr. E. S. Foster, Louisburg.
Gaston—Dr. J. H. Jenkins, Dallas.
Gates—Dr. I. W. Costen, Gatesville.
Graham—
Granville—Dr. W. O. Baskerville, Oxford.
Greene—Dr. E. H. Sugg, Snow Hill.
Guilford—Dr. A. R. Wilson, Greensboro.

HALIFAX—Dr. I. E. Green, Weldon.
HARNETT—Dr. J. F. McKay, Dickinson.
HAYWOOD—Dr. J. Howell Way, Waynesville.
HENDERSON—Dr. J. L. Egerton, Hendersonville.
HERTFORD—Dr. John W. Tayloe, Union.
HYDE—
IREDELL—Dr. W. J. Hill, Statesville.
JACKSON—Dr. W. F. Tompkins, Webster.
JOHNSTON—Dr. R. J. Noble, Selma.
JONES—Dr. R. A. Whitaker, Trenton.
LENOIR—Dr. C. B. Woodley, Kinston.
LINCOLN—Dr. W. L. Crouse, Lincolnton.
MACON—Dr. S. H. Lyle, Franklin.
MADISON—Dr. James K. Hardwicke, Marshall.
MARTIN—Dr. W. H. Harrell, Williamston.
McDOWELL—Dr. B. A. Cheek, Marion.
MECKLENBURG—Dr. H. M. Wilder, Charlotte.
MITCHELL—Dr C. E. Smith, Bakersville.
MONTGOMERY—Dr. W. A. Simmons, Troy.
MOORE—Dr. Gilbert McLeod, Carthage.
NASH—Dr. J. J. Mann, Nashville.
NEW HANOVER—Dr. R. D. Jewett, Wilmington.
NORTHAMPTON—Dr. H. W. Lewis, Jackson.
ONSLOW—Dr. E. L. Cox, Jacksonville.
ORANGE—Dr. C. D. Jones, Hillsboro.
PAMLICO—
PASQUOTANK—Dr. W. W. Griggs, Elizabeth City.
PENDER—Dr. George F. Lucas, Currie.
PERQUIMANS—Dr. John F. Speight, Hertford.
PERSON—Dr. C. G. Nichols, Roxboro.
PITT—Dr. W. H. Bagwell, Greenville.
POLK—Dr. O. S. Missildine, Tryon.
RANDOLPH—Dr. J. M. Boyette, Ashboro.
RICHMOND—Dr. J. M. Covington, Rockingham.
ROBESON—Dr. T. A. Norment, Jr., Lumberton.
ROCKINGHAM—Dr. D. W. Courts, Reidsville.
ROWAN—Dr. John Whitehead, Salisbury.
RUTHERFORD—Dr. W. A. Thompson, Rutherfordton.
SAMPSON—Dr. John A. Stevens, Clinton.
STANLY—Dr. D. P. Whitley, Millingport.
STOKES—Dr. W. L. McCanless, Danbury.
SURRY—Dr. J. B. Hollingsworth, Mt. Airy.
SWAIN—Dr. R. L. Davis, Bryson City.
TRANSYLVANIA—Dr. C. W. Hunt, Brevard.

TYRRELL—Dr. Ab. Alexander, Columbia.
UNION—Dr. J. E. Ashcraft, Monroe.
VANCE—Dr. W. T. Cheatham, Henderson.
WAKE—Dr. P. E. Hines, Raleigh.
WARREN—Dr. P. J. Macon, Warrenton.
WASHINGTON—
WATAUGA—Dr. W. B. Councill, Boone.
WAYNE—Dr. W. J. Jones, Jr., Goldsboro.
WILKES—Dr. J. W. White, Wilkesboro.
WILSON—Dr. Albert Anderson, Wilson.
YADKIN—Dr. T. R. Harding, Yadkinville.
YANCEY—Dr. J. L. Ray, Burnsville.

LETTER OF TRANSMISSION.

North Carolina Board of Health,
Office of the Secretary,
Raleigh, N. C., January 4, 1895.

His Excellency, Elias Carr,
Governor of North Carolina,

Sir:—In accordance with Section 3, Chapter 214, Laws of 1893, I have the honor to present this the Fifth Biennial Report of the North Carolina Board of Health.

With great respect,
Your obedient servant,
RICHARD H. LEWIS, M. D.,
Secretary and Treasurer.

FIFTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH.

1893-1894.

In the two years that have elapsed since our last report the cause of public hygiene in our State has been markedly advanced. The interest in this most important subject, both on the part of members of the medical profession and of the people generally, shows a very decided increase. While our work has been, and continues to be, largely "missionary" in character—to carry to those ignorant of, or indifferent to, its saving power the gospel of health—the Board has accomplished much positive good. We feel that we can claim without hesitation that the saving of many valuable lives and the prevention of a large amount of sickness can be directly traced to its efforts. The provisions of the law enacted by the last General Assembly requiring physicians to report immediately to the proper health officer cases of contagious and infectious disease and making it obligatory upon said health officer to see that such diseases "are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge, and that after the death or recovery or removal of a person sick of either of the diseases mentioned the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of

Health," have alone saved a loss to the State in dollars and cents, considering death and sickness in terms of money, far more than has been expended upon the Board from its establishment. Unfortunately the evidence in support of sanitary science is necessarily negative in character. Its function is not to cure disease and thus to positively save from death, but to prevent the inauguration of disease in the first instance and thus to save the well from both sickness and death which in many instances would have surely come to them but for the effective precautions of the health officer. There are many other excellent features in the new law bearing upon the protection of school children from disease, upon the drinking waters of the State, regulating common carriers, and others, for a consideration of which we would refer the reader to the law itself which he will find in another part of this report.

As a result of the marvelous advance in bacteriology a great discovery has been made in "antitoxine," which is regarded as a sure preventive of, and when used soon enough almost a sure cure for, diphtheria, the very name of which strikes terror to a parent's heart. The infectiousness of consumption is no longer disputed and knowing the cause, it can often be prevented by resorting to suitable precautions. With more knowledge we hope to do better work, and in the next two years to save very many more than ever before in the same length of time from sickness and death.

MEETINGS OF THE BOARD.

MINUTES OF THE ANNUAL MEETING AT RALEIGH IN 1893.

RALEIGH, N. C., May 10, 1893.

The North Carolina Board of Health met in regular annual session in the private office of the Yarborough House at 6 P. M.

In the temporary absence of the President Dr. George G. Thomas was, on motion, called to the chair. Present: Drs. Bahnson, Harrell, Hodges, Thomas, Venable, Mr. Chase and the Secretary.

On motion of Dr. Venable the action taken by the Board in the matter of the Quarantine Station at Southport by letter was ratified.

Dr. Bahnson, for the committee appointed to visit the School for the Deaf and Dumb at Morganton, and advise the Board of Directors of the same as to a water supply and system of sewerage, submitted a report of its work, stating that a copy had been sent to Dr. M. L. Reid, Chairman of the Board of Directors. On motion the report was accepted and indorsed.

A motion to proceed to the election of officers was carried, but as some doubt was expressed as to the tenure of office of the Secretary, whether he should hold for the unexpired term to which he was elected under the old law ('85), or whether he should be elected every two years, since the term of office of each member of the Board was made by the new law ('93) only two years, the President was requested to obtain the opinion of the Attorney General and report to the meeting next morning, to which time the Board then adjourned.

RICH'D H. LEWIS,
Secretary.

Raleigh, N. C., May 11, 1893.

The Board re-assembled in the Senate Chamber of the Capitol at 10 a. m., President Bahnson in the chair.

The President stated that he had consulted the Attorney General as to the term of office of the Secretary and that the latter had given it as his opinion that if the Secretary continued a member of the Board by re-appointment for so long a time he was entitled under the Constitution of the State to hold the office for the remainder of the six-year term of the late Secretary, Dr. Thomas F. Wood, to which he was elected.

Dr. Henry T. Bahnson was nominated for President and unanimously re-elected.

Messrs. Chase and Venable were appointed a committee to audit the accounts of the Treasurer. They reported them to be correct.

Adjourned.

RICH'D H. LEWIS,
Secretary.

ACTION OF THE NORTH CAROLINA BOARD OF HEALTH IN REGARD TO THE RESIGNATION OF DR. J. A. HODGES AND THE ELECTION OF HIS SUCCESSOR.

The following letter, which explains itself, was sent to every member of the Board:

NORTH CAROLINA BOARD OF HEALTH,
SECRETARY'S OFFICE,
RALEIGH, November 6, 1893.

MY DEAR DOCTOR:—I am instructed by President Bahnson to notify the members of the Board of the resignation, upon his removal from the State, of Dr. J. A. Hodges, and to ask each member to indicate in a letter to the Secretary (in order to save the expense of a meeting for the purpose) what action he desires taken thereon, and his choice for his successor.

Please write me promptly in accordance with the above and oblige,

Yours truly,
RICH'D H. LEWIS,
Secretary.

By the answers to the above letter received from all the members of the Board, and now on file in the Secretary's office, the resignation of Dr. Hodges was accepted and Dr. John Whitehead, of Salisbury, was unanimously elected to fill the vacancy.

Dr. Whitehead was duly notified of his election and signified his acceptance of the position.

RICH'D H. LEWIS,
Secretary.

MINUTES OF THE ANNUAL MEETING AT GREENSBORO IN 1894.

GREENSBORO, N. C., May 15, 1894.

The North Carolina Board of Health met in regular annual session in Room 15, Benbow House, at 9 P. M. There were present Drs. Bahnson, President; Harrell, Whitehead and Venable, Mr. Chase and the Secretary.

The minutes of the last meeting and of the action of the Board in regard to the resignation of Dr. J. A. Hodges and the election of his successor were read and approved.

Messrs. Chase and Venable were appointed by the President a committee to audit the accounts of the Treasurer.

The matter of the erection of a first-class Quarantine Station at Southport was informally discussed. Great regret was expressed at the action of the authorities of the city of Wilmington in refusing to appropriate the $5,000 necessary as a preliminary condition to receiving $20,000 from the State.

The transmission of typhoid fever was the subject of a general discussion of a very interesting character.

On motion it was ordered that the Board meet hereafter three times a year—every four months—the annual meeting to be held as usual with the State Medical Society, and the other two in September and January at such place as the Board may select and on such day as the President may appoint.

On motion Salisbury was selected as the place for the next or September meeting. The President was requested to appoint the day at his convenience.

On motion it was ordered that the public institutions of the State, including the convict camps, be inspected as far as practicable during the current year.

On motion the Secretary was instructed to purchase a library of reference books on sanitary subjects for the use of his office, and also similar books for the use of members of the Board.

Adjourned to 12 o'clock to-morrow.

RICH'D H. LEWIS,
Secretary.

GREENSBORO, N. C., May 16, 1894.

The Board re-assembled in Room 15 of the Benbow House at 6:40 P. M.; President Bahnson in the chair. Present: Drs. Bahnson, Battle, Harrell and Whitehead, Mr. Chase, Passed Assistant Surgeon J. J. Kinyoun, M. H. S., and the Secretary.

In response to an invitation from the Board to address them, Dr. Kinyoun made the following statement:

The Surgeon General of the Marine Hospital Service, Dr. Wyman, is very anxious to have all the larger ports put in good shape. All the ports except Wilmington are already well provided with quarantine facilities. It is his earnest desire to have a perfectly equipped station at Wilmington. The rules under the law of February, 1893, require that the dunnage of any infected vessel must be disinfected by steam and the hold of said vessel by 10 per cent. sulphur. If such facilities do not exist at a port the vessel must be remanded to a port that is supplied. This would wreck the commerce of Wilmington as matters now stand, which the Government would be very loth to do. An order has been issued to captains from West Indies and South American ports having yellow fever to report at once to United States stations. All sailing vessels from an infected port in West Indies are advised to go by one of the national stations at Tortugas or Sapelo for inspection and disinfection. The Surgeon General wishes to know if a properly equipped station cannot be established by the State. If not the United States have the law and ample means to do so.

After a full discussion of the above statement from the Marine Hospital Service the following motion was introduced by Dr. Battle and unanimously adopted:

> Moved, that in view of the inability or the unwillingness of the city of Wilmington to contribute its part towards carrying out the act of the last General Assembly providing for the erection of a first-class Quarantine Station at Southport, the Secretary of this Board be instructed to officially request the United States Marine Hospital Service to take charge of and operate that station; and that the Secretary be authorized to explain this action on the part of the Board.

The Auditing Committee reported that they had examined the accounts of the Treasurer and found them correct. Report adopted.

On motion the Board adjourned to meet in Salisbury in September.

RICH'D H. LEWIS,
Secretary.

MINUTES OF THE MEETING AT SALISBURY, SEPTEMBER 13, 1894.

SALISBURY, N. C., September 23, 1894.

The Board met after the adjournment of the Health Conference in private session at the Central Hotel. Present: Drs. Bahnson, Battle, Thomas, Whitehead and Lewis.

Drs. Bahnson and Lewis were elected delegates to the American Public Health Association. The appointment of delegates to the National Conference of State Boards of Health was left to the President. A letter from Dr. C. O. Probst, Secretary of the National Conference of State Boards of Health, stating that the annual dues of North Carolina for 1892, $10, had not been paid. was read. Upon a statement from the Treasurer of the Board that such was the fact, due doubtless to the prolonged illness of the Treasurer at that time, a motion was passed ordering it paid.

On motion the Secretary was ordered to have printed in pamphlet form, and generally distributed, the article on "The Prevention of Tuberculosis," by Dr. S. Westray Battle, and that on "Drinking Water in its Relation to Malarial Diseases," by the Secretary, just read before the Health Conference.

On motion Mr. J. C. Chase, the Engineer of the Board, was requested to make a thorough inspection of the various State institutions and of the water supplies and sewerage systems, present and prospective, of the more important cities and towns of the State and to report the results of the same to the Board.

On motion the meeting adjourned.

RICH'D H. LEWIS,
Secretary.

PROCEEDINGS HAD IN REGARD TO THE ELECTION OF A PRESIDENT OF THE BOARD TO SUCCEED DR. H. T. BAHNSON, RESIGNED.

Having been notified by his Excellency the Governor of the resignation from the Board of Dr. H. T. Bahnson, of Salem, for many years its active and efficient President, I addressed the following letters to each member of the Board. They show the method of the election of Dr. George Gillett Thomas, of Wilmington, as his successor in the presidency:

RALEIGH, N. C., November 21, 1894.

MY DEAR DOCTOR:—Dr. Bahnson, being a member of two boards, has thought it proper to resign from one of them, and has, I am sorry to say, elected to give up ours. We are, therefore, without a President, and the machinery of our law requires one. In order to save expense and time it has occurred to me that it would be best for me to call for nominations by letter and then to send a list of the nominees to each member of the Board for his ballot. If you approve this plan please make a nomination. If not, let me have your views as to the best course of action, and oblige,

Yours very truly,
RICH'D H. LEWIS,
Secretary.

P. S.—If a majority of the Board should nominate the same person we will, if you approve, consider that an election. R. H. L.

RALEIGH, N. C., December 8, 1894.

MY DEAR DOCTOR:—The "returns" are all in, and Dr. G. G. Thomas has been nominated by six (6) members and Dr. S. W. Battle by two (2) members for President of the Board. According to the understanding had in my former letter—that if any one member should happen to be nominated by a majority of the Board we would, without further correspondence, consider him elected—I now announce the election of Dr. George Gillett Thomas as President.

Very truly yours,
RICH'D H. LEWIS,
Secretary.

His Excellency the Governor appointed Dr. W. P. Beall, of Greensboro, to fill the vacancy on the Board caused by the resignation of Dr. Bahnson.

PROCEEDINGS

OF THE

CONJOINT SESSIONS OF THE STATE BOARD OF HEALTH

WITH THE

STATE MEDICAL SOCIETY IN 1893 AND 1894.

THE CONJOINT SESSION AT RALEIGH, MAY 11, 1893.

Dr. H. T. Bahnson was called upon to preside. He announced the first business in order to be the reading of the annual report of the Secretary:

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

By Richard H. Lewis, M. D., Raleigh, N. C.

By section 27 of the Act Relating to the Board of Health the Secretary is required to submit his annual report at this, the annual meeting of the Board. He is also required by section 3 of the same to make biennially to the General Assembly, through the Governor, a report of the work of the Board. In compliance with the latter the fourth biennial report for 1891-'92 was prepared and submitted, and the portion of it covering the period from the last annual meeting to January 1, 1893, is respectfully referred to as a part of this report. [Read from the biennial report the references to the life and work of Dr. Thomas F. Wood.]

On January 2d an invitation to meet with the State Board of Health in a Health Conference on January 24th in the city of Raleigh was mailed to the number of six hundred and fifty to the officers of the State Government, members of the General Assembly, Mayors of towns, County Superintendents of Health, Chairmen of Boards of County Commissioners, physicians and other prominent men. The attendance was not very large, but varied and of good quality. The number of County Superintendents of Health present (three, and one of them a member of the Legislature) was discouraging, particularly in view of the fact that one of the principal subjects for discussion named in the invitation was their own salaries, about which much complaint had been made. The following are the proceedings of the Health Conference:

RALEIGH, N. C., January 24, 1893.

On a call from the President of the State Board of Health, Dr. H. T. Bahnson, of Salem, that body met in the city of Raleigh on the above date, there being present Drs. J. H. Tucker, J. A. Hodges, Geo. G. Thomas, Prof. F. P. Venable and the Secretary.

There were present also Superintendents of Health, practicing physicians and other citizens interested in sanitation and the health of the State, all of whom were invited to meet with the State Board of Health in a Health Conference.

In the absence of President Bahnson the Secretary called the Conference to order, stating the object of the Conference to be a consideration of the best method to prevent the introduction of pestilential diseases into the State, the method of fixing the salaries of Superintendents of Health and other matters relating to the general health of the State.

He introduced the Mayor of the city of Raleigh, who extended a cordial welcome to the Conference and assured it of his hearty support in its efforts to promote the welfare of the State in the all-important matter of health.

The first order of business being the selection of a permanent chairman, Dr. Thomas nominated Col. W. H. S. Burgwyn, a man who had shown himself to be actively interested in the health matters of North Carolina. Col. Burgwyn was unanimously elected and on assuming the chair expressed himself as feeling highly honored by being invited to preside over the meeting and gladly offered all the assistance in his power to the Conference in improving the safeguards against the ravages of plagues and epidemics. The prosperity of the country is largely dependent upon the medical profession, and this is especially noteworthy of the next twelve months when the country is to undertake the stupendous task of entertaining the whole world and, at the same time, guard her citizens from the terrible plague which caused such destruction of life in Europe last year and which is apparently only waiting for the approach of warm weather to renew its work of devastation and destruction.

The Secretary presented as the first duty of the Conference the amendment of the health laws of the State, and read a copy of a law suggested by the President, after which he stated that a substitute for the old law had been drawn up by himself for the consideration of the Conference.

It was moved and decided that the Secretary read his proposed substitute for the existing laws section by section and if there be no objection raised the section be considered as approved by the Conference.

SECTION 1. Adopted without objection.

SEC. 2. There being some doubt as to whether the proposed reading would call for the election of six new members of the Board this year, it was corrected to make the fact clear that the successors of the present incumbents were to be elected only at the expiration of the terms of the present members; each new member being elected for six years.

SEC. 3. The important part of this section is the duty of the Board to inspect the public institutions of the State, and the Secretary explained that before any action was taken he had communicated with the chief officers of the asylums and of the Penitentiary and they had expressed the opinion that such inspection would be very proper and desirable. The section was approved; but later Dr. J. W. Jones thought that the inspection of the stockades should be made oftener than once a year, as frequently a stockade was not in existence so long as a year, and in that event it might not be inspected at all. An amendment was added to the section, providing for inspection as much oftener as requested by the "Board of Charities." The Secretary said that he had considered the advisability of having the superintendents of the public institutions make monthly reports to the Board of Health, but as they have to keep a record of these things any way, and include them in their regular reports, he thought it not well to impose this duty upon them.

SEC. 4. Approved without discussion.

SEC. 5. This section was amended so as to make eligible to membership in the County Boards of Health all properly registered physicians.

SEC. 6. Dr. Hodges thought the law regarding fines against Superintendents had been a dead law; that he believed these fines had never been collected. He had at times been delinquent in sending in his reports when he was a Superintendent and had never paid a fine. The Secretary explained that heretofore it had not been obligatory on the Secretary to notify the County Commissioners of the delinquency of the Superintendents. On motion the section was amended, making it the duty of the Secretary of the State Board to notify the Commissioners on the 11th of each month of any delinquency on the part of Superintendents to send in their reports by the 10th. As amended the section was adopted.

Sec. 7. This section, relating to the salaries of Superintendents of Health, provoked a very great deal of discussion by the members of the Conference generally. The Secretary thought the salaries of these officers should be imposed and regulated by legislative enactment so that they could act independently in performing their duties. There was a unanimity of opinion as to the fact that the salaries of the Superintendents were far from satisfactory, but there seeming to be an inability to come to any conclusion as to the best and wisest plan for improving them, Dr. Hodges moved that the matter be referred to a committee who should consider it and report at the afternoon session. The motion was carried.

Sec. 8. The Secretary explained that this section was introduced in its proposed form for the purpose of making one definite day for the election of Superintendents in all the counties of the State, and so that all terms of office would expire at the same time. Dr. Thomas thought the reason why local Boards of Health held such infrequent meetings was because they were invested with no power except to give advice and their advice generally resulted in nothing. The section was adopted.

Sec. 9. Adopted.

Sec. 10. Adopted.

Sec. 11. Adopted.

Sec. 12. Adopted.

Sec. 13. Dr. Hodges thought we ought to deal with great tenderness with the affairs of the public schools.

Some committeemen lived ten miles apart, and it would be hard to get them together to consider these things. The Secretary explained that it was only the diseases that were really dangerous to life that were included in this section. The section is intended to apply especially to city schools, but should also apply to county schools. Dr. Crouse thought the last clause requiring the child who persisted in coming to school while it was in dangerous contact with contagious diseases at home, to be dismissed from the school for the remainder of the term, a hardship on the child and not a punishment on the parent, where the blame should rest. After some discussion it was decided to leave this clause out, and as so amended the section was passed.

Sec. 14. Adopted.

Sec. 15. Amended so as to provide for the early removal of a suspect from the State, and was then adopted.

Sec. 16. Adopted after a slight amendment.

Sec. 17. This section was explained to refer to potable waters. It was then adopted.

Sec. 18. Adopted after a slight amendment.

The remaining sections were adopted without much discussion.

The Chair attempted to appoint the committee to take into consideration the matter of salaries of Superintendents of Health, but there were none willing to assume the office, and on motion it was referred back to the whole meeting for action and then postponed to the afternoon session.

The Conference then adjourned to 3 P. M.

AFTERNOON SESSION.

The Conference was called to order by the Chairman at 3 o'clock.

Section 7, relating to salaries of Superintendents, was introduced as the first order of business and again evoked much discussion, with final result of adopting the section as it now stands.

The matter of taking some action looking to securing some law of compulsory vaccination elicited quite a spirited debate. All present seemed to agree as to the desirability of a more general practice of vaccination, but some were doubtful as to the advisability of attempting to secure legislation to require vaccination just at present, as it might jeopardize the whole bill.

On motion the whole bill was adopted as a substitute for the present Act Relating to the Board of Health.

By invitation Dr. W. G. Curtis, Quarantine Physician of the station at the mouth of the Cape Fear river, read a paper with a description of the station as it now is, a recital of the needs of the station and a discussion of the probability of cholera getting into this State the coming summer.

During the latter part of the meeting Dr. Geo. G. Thomas presided, as Col. Burgwyn was obliged to leave.

After the reading of Dr. Curtis's paper, which was listened to with much interest, the Conference adjourned *sine die.*

RICH'D H. LEWIS,
Secretary.

Upon request the President of the Senate and the Speaker of the House announced a joint meeting of their respective Committees on Public Health—the first committees, by the way, on public health ever appointed by any Legislature in the history of the State, I am told—for the night after the adjournment of the Conference, to consult with members of the Board of Health in regard to sanitary matters generally, and the proposed legislation in the interest of the public health in particular. Messrs. Hodges, Venable, Thomas and the Secretary appeared before them, and the bill was read over and explained. Senator Lucas, of Bladen county, Chairman of the Senate Committee on Public Health, who had just been appointed on the Board by Governor Carr, took charge of the bill and introduced it in the Senate. The Secretary again appeared before the Senate Committee, to which it was referred on its introduction, and it was favorably reported with unanimity. He also had a number of personal interviews with Senators in regard to the importance of the act and besides sent a letter with a copy of the act to about one hundred physicians, County Superintendents and others, urging them to use their influence with their Senators and Representatives in effecting the passage of the bill.

This letter bore fruit, and after some delay and much vexation of spirit on the part of your Secretary the bill passed the Senate by a vote of thirty-four to eight, though somewhat damaged by amendments. The House Committee unanimously recommended its passage. Notwithstanding that fact when it came up on its second reading it was laid on the table in short order by a considerable majority, which of course would have been the end of it but for the tact and parliamentary skill of the Hon. Edmund Jones, of Caldwell, a warm personal friend of your Secretary, who got it up again and with the active assistance of a number of the best men in the House, medical and lay, secured its passage. I was very anxious to have some of the Senate amendments corrected in the House, but our friends in that body advised strongly against attempting any amendment on the ground that if they ever began to amend it it would probably come out in worse shape than the Senate had left it. Your Secretary deferred to their wisdom, feeling that it was better to take what we had than to run a serious risk of losing much more.

The act as finally passed differs from that proposed by the Health Conference essentially in these particulars: The appointment of five members instead of three out of the nine is given to the Governor and the term of office of all is made the same, two years—an unfortunate change, I think, in both respects.

The annual appropriation of $3,000 asked for was cut down to $2,000, the same as heretofore. In other respects it is essentially as introduced.

On the whole we have made a decided advance, as a comparison of the new with the old law will clearly show, I think. The old law, which was incorporated in the new, was improved in many respects and many new and valuable sections, providing for much better protection against the introduction and spread of contagious and infectious diseases, and for the preservation of water supplies, as well as improvements in other respects, were added. While our annual appropriation was not increased in dollars it was materially augmented by the removal of the $250 limit to our requisition on the State Printer for stationery and printing. The emergency fund was also increased from $2,000 to $5,000. The following is the law as it now stands:

AN ACT IN RELATION TO THE BOARD OF HEALTH, RATIFIED MARCH 1, 1893.

The General Assembly of North Carolina do enact:

SECTION 1. That the Medical Society of the State of North Carolina shall choose from its members by ballot four members, and the Governor of the State shall appoint five other persons (one of whom shall be a sanitary engineer) and they shall constitute "The North Carolina Board of Health."

SEC. 2. The members of the Board of Health elected by the State Medical Society shall be chosen to serve two years. Their term of office shall begin immediately upon the expiration of the meeting at which they were elected. Those appointed by the Governor shall serve two years, their term of office beginning with the first regular meeting of the Board after their appointment. In case of death or resignation the Board shall elect new members to fill the unexpired terms: *Provided*, the Governor shall fill such vacancies as may occur where he has made appointments.

SEC. 3. That the North Carolina Board of Health shall take cognizance of the health interests of the people of the State, shall make sanitary investigations and inquiries in respect to the people, employing experts when necessary; shall investigate the causes of disease dangerous to the public health, especially epidemics, the sources of mortality, the effect of locations, employments and conditions upon the public health. They shall gather such information upon all these matters for distribution among the people, with the especial purpose of informing them about preventable diseases. They shall be the medical advisers of the State and are herein specially provided for, and shall advise the government in regard to the location, sanitary construction and management of all State institutions, and shall direct the attention of the State to such sanitary matters as in their judgment affect the industries, prosperity, health and lives of the people of the State. They may make an inspection once in each year, and at such other times as they may be requested to do so by the State Board of Charities, of all public State institutions, including all convict camps under the control of the State Penitentiary, and make a report as to their sanitary condition, with suggestions and recommendations to their respective boards of directors or trustees; and it shall be the duty of the officials in immediate charge of said institutions to furnish all facilities necessary for a thorough inspection. The Secretary of the Board shall make biennially to the General Assembly, through the Governor, a report of their work.

SEC. 4. The State Board shall have a President and a Secretary, who shall also be Treasurer, to be elected from the members composing the Board. The President shall serve two years and the Secretary-Treasurer two years. The Secretary-Treasurer shall receive such yearly compensation for his services as shall be fixed upon by the Board, not to exceed one thousand dollars, but the other members of the Board shall receive no pay, except that each member shall receive four dollars a day and necessary traveling and hotel expenses when on actual duty attending the meetings of the Board or pursuing special investigations in the State, but when attending important sanitary meetings in other sections, the number of delegates thereto being limited to two, only actual traveling and hotel expenses shall be allowed. These sums shall be paid by the Treasurer on authenticated requisition approved and signed by the President.

SEC. 5. There shall be an auxiliary Board of Health in each county in the State. These Boards shall be composed of all registered physicians resident in the county, the Mayor of the county town, the Chairman of the Board of County Commissioners and the City Surveyor, when there is such an officer; otherwise the County Surveyor. From this number one physician shall be chosen by ballot to serve two years, with the title of Superintendent of Health. His duty shall be to gather vital statistics upon a plan designated by the State Board of Health. He shall always promptly advise the Secretary of the State Board of the unusual prevalence of disease in his county, especially of typhoid fever, scarlet fever, diphtheria, yellow fever, small-pox, or cholera. His reports shall be made regularly, as advised by the State Board, through their Secretary; and he shall receive and carry out as far as possible such work as may be directed by the State Board of Health. He shall make the medico-legal *post-mortem* examinations for coroners' inquests, and attend the prisoners in jail, home for the aged and infirm, and house of correction, and make an examination of lunatics for commitment. He shall be the sanitary inspector of the jail and home of his county, making monthly reports to the Board of County Commissioners: *Provided*, that if for any cause the County Board of Health should fail to meet as hereinafter set forth and elect a Superintendent, the County Commissioners shall elect from those physicians resident in the county eligible to membership in the County Board a Superintendent of Health: *Provided further*, that it shall be unlawful for said County Commissioners to elect any one not eligible to membership in the County Board to the office of County Superintendent of Health, if any such qualified physician can be found in the county willing to accept the office.

SEC. 6. Monthly returns of vital statistics, upon a plan to be made by the State Board of Health, or their Secretary acting under their instructions, shall be made by the County Superintendent to the Secretary of the State Board, and a failure to report by the tenth of the month for the preceding month shall subject the delinquent to a fine of one dollar for each day of delinquency, and this amount shall be deducted from the salary of the Superintendent by the Board of County Commissioners on the statement of such delinquency by the Secretary of the State Board of Health; and the said Secretary is hereby required to notify, on the eleventh day of each month, the Chairman of the Board of County Commissioners of such delinquency. The County Superintendent shall report to the Secretary of the State Board the presence in his county of any case of small-pox, yellow fever, typhus fever or cholera within twenty-four hours after it has come to his knowledge, and upon failure to make such report within the prescribed time the County Commissioners shall deduct five dollars from his salary for each day of delay in reporting.

SEC. 7. The salary of the County Superintendent of Health shall be paid out of the county treasury upon requisition and the proper vouchers as follows: The salary of the Superintendent of Health, or any other member of the Board who is required to do the service assigned him, shall be in accordance with the medical fees usual in his county, and for each inspection of the jail and county home, which he shall make monthly, he shall be paid as for one medical visit: *Provided*, that a definite salary of not less than ten nor more than one thousand dollars may be paid in lieu of fees if mutually agreeable to the Board of County Commissioners and the County Superintendent.

Sec. 8. The biennial meeting for the election of officers shall be, for the State Board of Health, on the second day of the annual meeting of the Medical Society of the State of North Carolina in eighteen hundred and ninety-three and every two years thereafter; for the County Boards it shall be held in the county court-house between the hours of 12 M. and 1 P. M. on the first Monday in September, eighteen hundred and ninety-three, and each two years thereafter: *Provided*, that the two-year term of office of any Superintendent shall not be curtailed thereby; but his successor, who shall be elected at the meeting on the first Monday in September, eighteen hundred and ninety-three, shall qualify upon the expiration of said term and hold office until the first Monday in September, eighteen hundred and ninety-five, when all County Superintendents shall be elected for the full term of two years, beginning and ending with the first Monday in September. In order to secure uniformity and certainty of action it shall be the duty of the Secretary of the State Board of Health to mail to every person in the State eligible to membership in the County Boards of Health, whose address can be obtained, on or before the twentieth day of the August next preceding the time of meeting hereinbefore appointed, a printed notice of said meeting setting forth time and place.

Sec. 9. Inland quarantine shall be under the control of the County Superintendent of Health, who shall see that diseases especially dangerous to the public health, viz., small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge; and that after the death or recovery or removal of a person sick of either of the diseases mentioned the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of Health. The expense of the quarantine and of the disinfection shall be borne by the householder in whose family the case occurs, if able; otherwise by the city, town or county of which he is a resident. The failure on the part of a County Superintendent of Health to perform the duties imposed in this section shall be punished by the deduction of five dollars for each day of delinquency from his salary by the Board of County Commissioners; and if it shall appear to the satisfaction of the County Board of Health that the death of any person from the spread of the disease can justly be attributed to such failure of duty on his part, he shall be deposed from office and a successor immediately elected to fill out his unexpired term. Any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection shall be deemed guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars, or less than ten nor more than thirty days. In case the offender be stricken with the disease for which he is quarantinable, he shall be subject to the penalty on recovery, unless in the opinion of the Superintendent it should be omitted: *Provided, however*, that in any city or incorporated town having a regularly appointed medical health officer who is a member of the County Board of Health, the duties assigned in this section to the County Superintendent of Health shall be performed by the said medical health officer for the people of his city or town, and he shall be subject to the same penalties for dereliction of duty at the hands of the Board of Aldermen or Town Commissioners as are directed to be imposed by the County Commissioners and County Board of Health upon the Superintendent: *Provided further*, that the quarantine of ports shall not be interfered with, but the officers of the local and State Boards shall render all aid in their power to quarantine officers in the discharge of their duties upon the request of the latter: *Provided*, that the custody and care of any child or other person may remain in custody of parent or family.

Sec. 10. When a householder knows that a person within his family is sick with either of the diseases enumerated in section nine he shall immediately give notice thereof to the health officer or Mayor, if he resides in a city or incorporated town, otherwise to the County Superintendent of Health, and upon the death or recovery or removal of such person the rooms occupied and the articles used by him shall be disinfected by such householder in the manner indicated in Section Nine. Any person neglecting or refusing to comply with any of the above provisions shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one dollar nor more than fifty dollars.

Sec. 11. When a physician knows that a person whom he is called to visit is infected with small-pox, diphtheria, scarlet fever, typhus fever, yellow fever or cholera he shall immediately give notice thereof to the health officer or Mayor, if the sick person be in a city or incorporated town, otherwise to the County Superintendent of Health, and if he refuses or neglects to give such notice of it in twenty-four hours he shall be guilty of a misdemeanor and shall be fined for each offense not less than ten nor more than twenty-five dollars. And it shall be the duty of the said County Superintendent, health officer or Mayor receiving such notice of the presence of a case of small-pox, yellow fever, typhus fever or cholera within his jurisdiction to communicate the same immediately by mail or telegraph to the Secretary of the State Board of Health. A failure to perform this duty for twenty-four hours after the receipt of the notice shall be deemed a misdemeanor, and shall subject the delinquent upon conviction to a fine of not less than ten nor more than twenty-five dollars.

SEC. 12. The County Superintendents of Health, or the Boards of Health in the several cities and towns where organized, otherwise the authorities of said cities or towns, shall cause a record to be kept of all reports received in pursuance of the preceding sections, and such records shall contain the names of all persons who are sick, the localities in which they live, the diseases with which they are affected, together with the date and names of all persons reporting any such cases. The Boards of Health of cities and towns wherever organized, and where not the Mayors of the same, and in other cases the County Superintendent of Health, shall give the school committee of the city or town, the principals of private schools and the Superintendent of Public Instruction of the county, when the schools are in session, notice of all such cases of contagious diseases reported to them according to the provisions of this act. A failure to perform this duty for twenty-four hours after the receipt of the notice shall be deemed a misdemeanor, and subject the delinquent upon conviction to a fine of not less than ten nor more than fifty dollars.

SEC. 13. The school committees of public schools, superintendents of graded schools and the principals of private schools shall not allow any pupil to attend the school under their control while any member of the household to which said pupil belongs is sick of either small-pox, diphtheria, measles, scarlet fever, yellow fever, typhus fever or cholera, or during a period of two weeks after the death, recovery or removal of such sick person; and any pupil coming from such household shall be required to present to the teacher of the school the pupil desires to attend a certificate from the attending physician, city health officer or County Superintendent of Health of the facts necessary to entitle him to admission in accordance with the above regulations. A wilful failure on the part of any school committee to perform the duty required in this section shall be deemed a misdemeanor, and upon conviction shall subject each and every member of the same to a fine of not less than one nor more than twenty-five dollars: *Provided*, that the instructions in accordance with the provisions of this section given to the teachers of the schools within twenty-four hours after the receipt of each and every notice shall be deemed performance of duty on the part of the school committee. Any teacher of a public school and any principal of a private school failing to carry out the requirements of this section shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one nor more than twenty-five dollars.

SEC. 14. When a person coming to a city or town from abroad or from some other place in this State is infected or has lately been infected with either of the diseases mentioned in Section Nine the local Board of Health where such exists, otherwise the Board of Aldermen or Board of Town Commissioners, shall make effective provision in the manner which it judges best for the safety of the inhabitants by removing such person to a separate house or otherwise, and by providing nurses and other assistance and necessaries, which shall be at the charge of the person himself or his parents, where able, otherwise at the charge of the city, town or county to which he belongs.

SEC. 15. The Board of Health, or, in case there is no Board of Health, the Board of Aldermen or Town Commissioners of a city or town near to or bordering upon either of the neighboring States, may appoint, by writing, suitable persons to attend at places by which travelers may pass from infected places in other States, who may examine such travelers as may be suspected of bringing any infection dangerous to the public health, and if it need be may restrain them from traveling until licensed thereto by the Board of Health or Board of Aldermen or Town Commissioners of the city or town to which they may come. A traveler coming from such infected places who, without such license, travels within this State (except to return by the most direct route to the State whence he came) after he has been cautioned to depart by the persons so appointed, shall be isolated or ejected, at the discretion of the local city or town or county Board of Health; and upon refusal to comply with the regulations of the said Boards of Health or either of them on this subject shall be guilty of a misdemeanor, and upon conviction shall be fined not less than twenty-five nor more than fifty dollars or imprisoned not more than thirty days. And all common carriers bringing into this State any such persons as named above are hereby required to return them to some point without this State, if required by a city, town or county Board of Health. Nothing in this section shall prevent the State Board of Health in time of epidemics from appointing such additional examiners as they may deem necessary to the preservation of the public health.

SEC. 16. No railroad corporation or other common carrier or person shall convey or cause to be conveyed through or from any city, town or county in this State the remains of any person who has died of smallpox, measles, scarlet fever, diphtheria, typhus fever, yellow fever or cholera until such body has been disinfected and encased in such manner as shall be directed by the State Board of Health, so as to preclude any danger of communicating the disease to others by its transportation; and no local registrar, clerk or health officer, or any other person, shall give a permit for the removal of such body until he has received from the Board of Health of the city, or from the Board of Aldermen or Town Commissioners, or the County Superintendent of the city, town or county where the death occurred, a certificate stating the cause of death and that the said body had been prepared in the manner set forth in this section; which certificate shall be delivered in duplicate to the agent or person who receives the body, and one copy shall be pasted on the box containing the corpse; said certificate shall be furnished in blank by the transportation company when no local board of health exists. During an epidemic of cholera all common carriers shall so arrange their water-closets as to catch in water-tight receptacles the dejections of all persons using the same and shall disinfect the said dejections in a manner satisfactory to the State Board of Health before emptying them. Any person violating the provisions of this section shall be punished by fine not exceeding twenty-five dollars.

Sec. 17. In times of epidemics of small-pox, yellow fever, typhoid fever, scarlet fever, diphtheria, typhus fever, cholera, the State Board of Health shall have sanitary jurisdiction in all cities and towns not having regularly organized local boards of health, and are hereby empowered to make all such regulations as they may deem necessary to protect the public health, and to enforce, in courts of justices of the peace, the same by the imposition of such penalties as come within the jurisdiction of a justice of the peace.

Sec. 18. *Water and water supply.*—The State Board of Health shall have the general oversight and care of all inland waters and shall from time to time, as it may deem expedient, cause examinations of the said waters to be made for the purpose of ascertaining whether the same are adapted for use as sources of domestic water supplies, or are in a condition likely to impair the interests of the public or persons lawfully using the same, or imperil the public health. For the purposes aforesaid it may employ such expert assistance as may be necessary.

Sec. 19. The said Board shall from time to time consult with and advise the boards of directors of all State institutions, the authorities of cities and towns, corporations or firms already having or intending to introduce systems of water supply, drainage or sewerage, as to the most appropriate source of supply, the best practicable method of assuring the purity thereof, or of disposing of their drainage or sewerage, having regard to the present and prospective needs and interests of other cities, towns, corporations or firms which may be affected thereby. All such boards of directors, authorities, corporations and firms are hereby required to give notice to said Board of their intentions in the premises and to submit for its advice outlines of their proposed plans or schemes in relation to water supply and disposal of sewage, and no contract shall be entered into by any State institution, city or town for the introduction of a system of water supply or sewage disposal until said advice shall have been received and considered: *Provided, however*, that any city or town having a regularly organized Board of Health may seek advice therefrom or from its County Board of Health in lieu of that of the State Board.

SEC. 20. Whoever willfully or maliciously defiles, corrupts or makes impure any well. spring or other source of water supply or reservoir, or destroys or injures any pipe, conductor of water or other property pertaining to an aqueduct, or aids and abets in any such trespass, shall be guilty of a misdemeanor, and on conviction shall be fined not exceeding one thousand dollars or imprisoned not exceeding one year.

SEC. 21. Any householder in whose family there is to his knowledge a person sick of cholera or typhoid fever, who shall permit the bowel discharges of such sick person to be emptied without first having disinfected them according to the instructions to be obtained from the attending physician or the County Superintendent of Health shall be guilty of a misdemeanor, and upon conviction shall be fined not less than two nor more than twenty-five dollars, or imprisoned not less than ten nor more than thirty days. And in cases where such undisinfected discharges are emptied on the water shed of any stream or pond furnishing the source of water supply of any public institution, city or town the penalty shall be a fine of not less than twenty-five nor more than fifty dollars, or imprisonment for not more than thirty days. And any physician attending a case of cholera or typhoid fever who refuses or neglects to give the proper instructions for such disinfection as soon as the diagnosis is made shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than ten nor more than fifty dollars.

SEC. 22. Whenever and wherever a nuisance upon premises shall exist which in the opinion of the County Superintendent of Health is dangerous to the public health, it shall be his duty to notify in writing the parties occupying the premises (or the owner, if the premises are not occupied) of its existence, its character and the means of abating it. Upon this notification the parties shall proceed to abate the nuisance, but failing to do this shall be adjudged guilty of a misdemeanor and shall pay a fine of one dollar a day dating from twenty-four hours after the notification has been served, the amounts so collected to be turned over to the County Treasurer: *Provided, however*, that if the party notified shall make oath or affirmation before a justice of the peace of his or her inability to carry out the directions of the Superintendent it shall be done at the expense of the town, city or county in which the offender lives. In the latter case the limit of the expense chargeable to the town, city or county shall not be more than one hundred dollars in any case: *Provided further*, that nothing in this section shall be construed to give the Superintendent the power to destroy or injure property without a due process of law as now exists for the abatement of nuisances.

Sec. 23. *Vaccination.*—On the appearance of a case of small-pox in any neighborhood all due diligence shall be used by the Superintendent of Health that warning shall be given, and all persons not able to pay shall be vaccinated free of charge by him, and the County Superintendent shall vaccinate every person admitted into a public institution (jail, county home, public school) as soon as practicable, unless he is satisfied upon examination that the person is already successfully vaccinated; the money for vaccine to be furnished by the County Commissioners. The authorities of any city or town, or the Board of County Commissioners of any county, may make such regulations and provisions for the vaccination of its inhabitants under the direction of the local or county Board of Health or a committee chosen for the purpose, and impose such penalties as they may deem necessary to protect the public health.

Sec. 24. The Board of County Commissioners of each county is hereby authorized at any time to call a meeting of the County Board of Magistrates or Justices of the Peace to take into consideration the health interest of the people of their county, and, with the approval of the said Board of Magistrates, to levy a special tax to be expended under the direction of a committee composed of the Chairman of the Board of County Commissioners, the Mayor of the county town and the County Superintendent of Health for the preservation of the public health.

Sec. 25. The authorities of any city or town are hereby authorized, not already authorized in its charter, to make such regulations, pay such fees and salaries and impose such penalties as in their judgment may be necessary for the protection and the advancement of the public health.

Sec. 26. Bulletins of the outbreak of disease dangerous to the public health shall be issued by the State Board whenever necessary, and such advice freely disseminated to prevent and check the invasion of disease into any part of the State. It shall also be the duty of the Board to inquire into any outbreak of disease by personal visits or by any method the Board shall direct. The compensation of members on such duty shall be four dollars a day and all necessary traveling and hotel expenses.

Sec. 27. Special meetings of the State Board of Health may be called by the President through the Secretary. The regular annual meetings shall be held at the same time and place as the State Medical Society, at which time the Secretary shall submit his annual report.

Sec. 28. For carrying out the provisions of this act two thousand dollars, or so much thereof as may be necessary, are hereby annually appropriated, to be paid on requisition to be signed by the Secretary and President of the State Board of Health; and the printing and stationery necessary for the board to be furnished upon requisition upon the State Printer. A yearly statement shall be made to the State Treasurer of all moneys received and expended in pursuance of this act.

SEC. 29. A contingent fund of five thousand dollars is hereby appropriated, subject to the Governor's warrant, countersigned and recorded by the Auditor of the State, to be expended in pursuance of the provisions of this act when rendered necessary by a visitation of cholera or any other pestilential disease.

SEC. 30. All previous acts conflicting with this act, and also all previous acts of appropriation for the public health, are hereby repealed upon the passage of this act: *Provided*, that nothing herein shall operate as a repeal or abridgment of powers conferred by any special act on any local Board of Health.

SEC. 31. That this act shall be in force from and after its ratification.

Ratified the 1st day of March, A. D. 1893.

On January 27th letters with new blanks to be used for monthly reports were sent to all County Superintendents and town reporters.

On March 10th a letter and blank were sent to every Clerk of the Superior court in the State asking for a list of all the registered physicians in each county.

On the 28th of March a second letter was sent to thirty-one Clerks who had not responded to first letter.

On April 4th a letter of acknowledgment, together with a copy of the "Laws Regulating the Practice of Medicine in North Carolina," was mailed to all Clerks who had sent in lists.

This letter explained to them the requirements for registration, as the lists showed some illegal registrations had been made.

While the administration of the laws regulating medical practice does not come technically within the jurisdiction of the Secretary of the State Board of Health it has a sufficient bearing on the health of the people, he thinks, to justify his action in availing himself of an opportunity to probably correct some errors in the registration of physicians that had been made—and to prevent their occurrence in the future, by calling the attention of the Clerks of Court especially to the law as it now stands. It is gratifying to know that his efforts were appreciated, by some of the Clerks at any rate, and that one to his certain knowledge recalled certificates which under a misapprehension had been incorrectly issued.

In response to a call for a Conference of State Boards of Health to be held in New York on April 5, 1893, to consult upon the conditions of the quarantine stations of the country and other matters pertaining to keeping out pestilential diseases, the President and Secretary attended as delegates from this Board.

The principal business accomplished by this Conference over and above the good resulting from personal contact and interchange of ideas is set forth in the published report of the Secretary of that body.

On April 12th your Secretary received this letter:

WILMINGTON, N, C., April 11, 1893.

Dr. R. H. Lewis, Secretary State Board of Health, Raleigh, N. C.,

DEAR DOCTOR:—The Quarantine Board of the port of Wilmington respectfully submit that, in view of the opinion expressed by the Conference of Health Officers that the emergency demanded the erection and operation of disinfecting plants at seaport towns, the State Board of Health take up the question and consider the advisability of making available the appropriation made for this port by the last Legislature.

Respectfully,
GEO. GILLETT THOMAS,
Secretary Board of Quarantine, Port of Wilmington, N. C.

In consequence thereof I addressed the following letter to each member of the Board of Health, inclosing a copy of Dr. Thomas's letter with an abstract of the minutes of the Conference and of the legislative act making the appropriation:

Raleigh, N. C., April 14, 1893.

Dear Doctor:—I have just received the following letter from the Secretary of the Board of Quarantine of the port of Wilmington: "The Quarantine Board of the port of Wilmington respectfully submit that, in view of the opinion expressed by the Conference of Health Officers that the emergency demanded the erection and operation of disinfecting plants at seaport towns, the State Board of Health take up the question and consider the advisability of making available the appropriation made for this port by the last Legislature."

The following is an extract from a report of the proceedings of the Conference: "Dr. H. B. Baker, of Michigan, offered the following, which was unanimously adopted: '*Resolved*, That in the present emergency every State maintaining a maritime quarantine should possess a perfectly equipped station with all appliances necessary for thorough disinfection of infected vessels, unless there are special reasons to the contrary.' The last clause was added to cover the case of States like New Jersey, which can avail themselves of the stations of neighboring States."

As this is a matter of urgent importance, in order to save delay and the necessity of a special meeting of the Board so near the time of the regular meeting on the 10th prox., I would thank you for an immediate expression of opinion by letter on the question. If a majority of the Board reply in the affirmative, and the Governor approves, the Quarantine Board would feel authorized to give out the contracts at once, and more regular action could be taken by the Board of Health when it meets, if deemed necessary.

The facts on which the above letter is based are these: The last Legislature appropriated $20,000 for a modern disinfecting plant at Southport, which now has none at all, but attached the condition that the money should not be available until "in the opinion of the Governor and the State Board of Health the entrance of cholera into the port is imminent." Upon the construction of the word "imminent" hangs the decision. In Worcester's Comprehensive Dictionary the word "imminent" is defined "impending; threatening; near," the only meanings given. In the opinion of the recent Conference alluded to in the letter quoted cholera is "impending; threatening; near," as it doubtless is in the opinion of nearly every other person of any sanitary experience, owing to our constant intercourse with western Europe. In this case the word imminent could not be taken to mean something "about to fall on the instant," for it would be manifestly absurd to wait until a ship with cholera on board had entered the mouth of the Cape Fear before giving out the contract for apparatus requiring two or three months for its construction to prevent the entrance of the disease. So that in the opinion of the undersigned, as well as of two other members of the Board with whom he has spoken, "the danger of the entrance of cholera into the port of Wilmington is imminent" in the sense in which the word can alone be reasonably applied to the case in hand. Please let me know by return mail whether you agree or disagree with that opinion. Not a day is to be lost if any thing is to be done.

Very truly yours,
RICH'D H. LEWIS,
Secretary.

To this letter replies were received from all the members, only one opposing the appropriation. As soon as a majority had been heard from, realizing the importance of getting to work on the Quarantine Station at the earliest possible moment, I wrote to his Excellency Governor Carr, who was then at Rocky Mount, which letter was delayed in reaching him. Immediately upon his return to the capital I laid the matter with the correspondence before him. He appointed an hour the same afternoon for me to call for his decision, but before it arrived he was unexpectedly summoned to Newbern. On his return, having received replies from every member of the Board, I addressed to him this communication:

MAY 1, 1893.

His Excellency Elias Carr, Governor of North Carolina,

SIR:—Since my communication of the 17th ult., addressed to you at Rocky Mount, stating that "replies from a majority (of the Board of Health) expressing the opinion that 'the entrance of cholera into the port of Wilmington as imminent' had been received," I have heard from every member. The replies from eight are as above, and from one to the effect that the entrance of cholera is no more imminent now than at the time of the passage of the act. I beg to dissent from that opinion, for the reason that a number of fresh cases have occurred on the west coast of Europe since the adjournment of the Legislature, and sanitarians now consider the outlook for the summer very gloomy.

The Quarantine Board of Wilmington now awaits the concurrence of your Excellency in the opinion of the State Board of Health, as required by the act, before beginning this work of such great importance in protecting the port and State from the scourge which threatens us. With great respect,

Your obedient servant,
RICH'D H. LEWIS,
Secretary.

To this letter the Governor replied as follows:

MAY 1, 1893.

Dr. Richard H. Lewis, Secretary N. C. Board of Health, Raleigh, N. C.,

DEAR SIR:—Replying to your kind favor of the 1st instant, I would state, in accordance with your views and the other members of the State Board of Health, and after viewing the situation as it is, that, section 2 of the act to amend section 2915 of The Code as follows: "For the purpose of carrying into effect the provisions of section 2915 as herein amended the sum of twenty thousand ($20,000) dollars is hereby appropriated out of any moneys in the State Treasury not otherwise appropriated, to be paid from time to time, as required in the prosecution of the work, on the requisition of the Treasurer of the Quarantine Board and approved by its President: *Provided*, that the funds appropriated by this act shall not be paid over by the Treasurer until the Governor and State Board of Health of North Carolina shall certify to the Treasurer that there is imminent danger of cholera visiting the city of Wilmington or other sections of the State," makes it my plain duty to inform you that the amount appropriated ($20,000) is now available, and can be used in carrying out the provisions of the act.

With highest esteem, I am, Yours very truly,

ELIAS CARR,
Governor.

I immediately wired the Secretary of the Quarantine Board of Wilmington:

Governor approves. Go ahead.

R. H. LEWIS,
Secretary.

Afterwards I wrote him as follows:

MAY 2, 1893.

Dr. Geo. G. Thomas, Secretary Board of Quarantine, Port of Wilmington,

MY DEAR DOCTOR:—In compliance with your communication of the 11th ult., calling upon the State Board of Health to "take up the question and consider the advisability of making available the appropriation made for the port by the last Legislature," I addressed a letter setting forth the facts to each member of the Board. Replies from all were duly received—eight voting in favor and one against complying with the condition necessary to make the appropriation available.

The whole correspondence was laid before his Excellency, the Governor, at the earliest opportunity, and to-day I received his decision. I inclose his letter, which, after submitting it to your Board, you will please return and oblige,

Yours truly,

RICH'D H. LEWIS, M. D.,
Secretary.

While the securing of a quarantine station with all the modern improvements for our chief seaport, a work of the highest value, from a sanitary point of view, to the State, cannot be credited to our Board, it is gratifying to know that the leader in that movement was one of our members, Dr. George G. Thomas, who was most ably assisted by Dr. T. S. Burbank, Messrs. J. C. Stevenson, Alex. Sprunt and others. Thanks to their efforts and to our enlightened and progressive Legislature North Carolina will soon be abreast of the most advanced communities in the matter of maritime quarantine protection.

In the performance of the duty imposed upon me in Section 9 of the Act Relating to the Board of Health I prepared the following pamphlet containing instructions for Quarantine and Disinfection:

INSTRUCTIONS FOR QUARANTINE AND DISINFECTION.

EXTRACT FROM SECTION NINE OF AN ACT RELATING TO THE BOARD OF HEALTH, RATIFIED MARCH 1, 1893.

"Inland quarantine shall be under the control of the County Superintendent of Health, who shall see that diseases especially dangerous to the public health, viz.: small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge; and that after the death or recovery or removal of a person sick of either of the diseases mentioned, the rooms occupied and the articles used by the patient are thoroughly disinfected in the manner set forth in the printed instructions, both as to quarantine and disinfection, which shall be furnished him by the Secretary of the State Board of Health. The expense of the quarantine and of the disinfection shall be borne by the householder in whose family the case occurs, if able, otherwise by the city, town or county of which he is a resident. * * * Any person neglecting or refusing to comply with or in any way violating the rules promulgated in the manner above set forth on the subjects of quarantine and disinfection shall be deemed guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, not less than five nor more than fifty dollars, or less than ten nor more than thirty days. * * * In any city or incorporated town having a regularly appointed medical health officer who is a member of the County Board of Health, the duties assigned in this section to the County Superintendent of Health shall be performed by the said medical health officer for the people of his city or town. * * * "

1. Every person sick of either of the diseases mentioned in the above extract from section nine should be immediately isolated, with his nurses, in a separate room, if there is one, and nothing should be taken out of

such room at any time without having been previously disinfected in the manner described under the head of disinfection. The mildness of the attack must not be permitted to beget laxity in carrying out these instructions.

2. When any of the diseases mentioned above occurs in a house containing only one room, the house and all persons residing therein should be quarantined. The same rule should apply to the entire house, even if of sufficient size to permit the isolation of the sick person and his nurses in a separate room, in cases of small-pox, cholera, yellow fever, and typhus fever; but in cases of scarlet fever and diphtheria the quarantine need extend only to the room occupied by the patient and his nurses and to the occupants thereof. Whenever possible persons sick of small-pox, cholera, typhus fever or yellow fever should be immediately removed to quarters specially provided for the detention and treatment of such cases. Particular care should be taken to quarantine for a time sufficiently long to insure safety to others all persons who were exposed to infection before the removal of the patient.

3. When a house or room is in quarantine no one whatever except the attending physician and the clergyman of the family should be admitted. The person doing the outside service for a quarantined family should take orders verbally from a distance, and should lay down at the entrance of the house or room any articles he may bring there. No pet dog or cat should be allowed in the room.

4. When either of the diseases mentioned has declared itself in a house no work for trade purposes or for private families should be taken in by any one inhabiting the same, and all such work as may have been taken in before the outbreak of the disease should be disinfected before being sent home.

5. No person recovering from either of these diseases, and no person who has nursed such a patient, should quit the house before receiving a certificate from the County Superintendent of Health, municipal medical health officer, or attending physician, that the precautions required under the head of disinfection have been taken. Children must have certificate before re-entering school. See section 13 of the law.

6. No person residing in a quarantined house should go beyond the lot (or farm, provided there be no other persons living thereon) or put himself in direct communication with any one from outside.

7. When a house is quarantined any person residing therein, other than the patient, who wishes to leave for the purpose of changing his residence, may do so with the written permission of the County Superintendent of Health or municipal medical health officer, provided he takes all the precautions required under disinfection.

8. The body of every person who has died of either of the diseases mentioned should be disinfected in the manner described below. It

should be kept isolated up to the moment of the funeral in the room occupied by such person during his illness. The funeral should take place as soon as possible, and in all cases be private, attended only by those absolutely necessary to the proper performance of the burial, unless the body having been disinfected be in a metal coffin hermetically sealed. Children should under no circumstances be present.

9. When there is a case of either of the diseases mentioned in a house a placard stating the name of the disease, to be furnished by the County Superintendent of Health, shall be posted on the front door of said house. This placard must not be removed in any case until the premises have been properly disinfected, and then only by the County Superintendent of Health or municipal medical health officer in person, or by express permission of the same.

DISINFECTION.

I. DURING THE CONTINUANCE OF THE DISEASE.

(*a*). All the sunlight possible and as much fresh air as the nature of the disease and the state of the weather will permit should be admitted to the sick-room.

(*b*). *The expectorations and evacuations of the patient* should be received in vessels in which there is a considerable quantity of bichloride of mercury, solution No. 2, or milk of lime, or an equal quantity of either of them should be added thereto and the mixture allowed to stand at least a half hour before throwing into the water-closet, if the house be connected with a system of sewers, or, otherwise, should be buried at a distance of not less than 100 feet from any well or spring.

(*c*). *Soiled body and bed-clothing, handkerchiefs, rags, etc.*, should, as soon as discarded, be immediately burned or immersed in a vessel of sufficient size, containing enough of the zinc or chloride of lime solution to completely cover them, and kept there until they can be thoroughly boiled for not less than a half hour in plain water, or better the zinc solution, and then washed and dried in the sun.

(*d*). The remains of the food served to the patient should be burned in the room or soaked in one of the disinfecting solutions mentioned and then buried.

II. AFTER THE RECOVERY, REMOVAL OR DEATH OF THE PATIENT.

(*a*). *Of the articles used and room occupied by the patient.* The vessels should be washed with a disinfecting solution. Burn in a hot fire sufficiently fierce to consume quickly and completely such articles as are not too valuable. Others that can be boiled without injury should be boiled hard for not less than a half hour, then thoroughly washed and dried in the sun. The remainder—furniture, curtains, woolen clothes, pillows, beds, mattresses (the contents of mattresses when straw, shucks or other cheap material should be burned and the ticks boiled) and all other articles which have been exposed to the infection should be hung on racks, or otherwise loosely distributed about the room, so as to permit free access of the gas to every part, the carpet, if there be one, being left on the floor, and then disinfected at the same time with the room by sulphur fumigation. Afterwards they should be taken into the open air and thoroughly beaten and sunned.

If preferred, in cases where every article in the room can be subjected to the process to be named, or when the room cannot be made tight enough to retain the sulphur fumes, every article in the room which can be should be boiled and the remainder, including the floor and woodwork, should be well washed with the bichloride solution No. 1. The walls and ceiling should have the same solution *thoroughly* applied to them or be well whitewashed.

(*b*). *Of the person of the recovered patient.* Wash the body, including the hair, with the bichloride solution No. 1 and put on clean clothes that have not been in the sick-room or that have been disinfected as prescribed in 1 (c).

(*c*). *Of the dead body.* Wrap the body in a well-sewed sheet thoroughly saturated with the bichloride solution No. 2 or with the chloride of lime solution. Put two pounds of chloride of lime in the coffin.

(*d*). *Of persons before leaving a house which has been quarantined.* Wash at least the uncovered portions of the body—hands, face, beard and hair —better the entire body—in the bichloride solution No. 1 and put on clean clothes that have not at any time been exposed to the infection or have been disinfected in the manner described. The notice of the attending physician and visiting clergyman is called to the importance of their observing these precautions and at least washing their hands in the bichloride solution the last thing before leaving the room.

(*e*). *Of a vehicle used to carry the body, living or dead, affected with either of the diseases enumerated.* Remove all cushions, curtains and other accessories and disinfect by boiling or soaking in the bichloride solution No. 1 and wash out the interior with bichloride solution No. 2.

DISINFECTANTS.

1. *Bichloride of mercury, solution No. 1.* Bichloride of mercury 1 drachm, water 1 gallon.

2. *Bichloride of mercury, solution No. 2.* Two drachms to the gallon.

Owing to its poisonous character a solution of bichloride should be colored with bluing to prevent mistakes. It should be kept in earthen or wooden vessels, as it corrodes metals.

3. *Zinc solution.* Sulphate of zinc (white vitriol) 4 ounces, salt 2 ounces, water 1 gallon.

4. *Chloride of lime solution.* Fresh chloride of lime 6 ounces, water 1 gallon.

5. *Milk of lime (whitewash).* Pour on 1 quart of quick-lime, broken into small pieces, 1 quart of water. As soon as reduced to powder add 3 quarts of water. Store in well-closed vessel. Make fresh supply every few days, as it does not keep well. Can be kept much longer by pouring one-half cup of kerosene on top to exclude air.

6. *Sulphur fumigation.* The room must be vacated. Close as tightly as possible every opening, fire-place by stuffing throat of chimney with old bags or plenty of straw; cracks around doors and windows by calking with tow or cotton, etc. Place small lumps or powdered sulphur, in the proportion of 3 pounds for every 1,000 cubic feet of air space to be disinfected, in an iron pot or pan free from cracks. Set the vessel, if it has no legs, on bricks in the bottom of a tub containing 2 or 3 inches of hot water (to put out fire in case burning sulphur should leak out or overflow); light with red-hot coals or by pouring on a tablespoonful of alcohol and applying a match. Be careful not to inhale the fumes. Close the door of exit as tight as possible. Keep the room closed for twelve hours, except in cases where family has no other room to sleep, then six hours. Then open all doors and windows and air thoroughly.

NOTE.

It is practically established that if the instructions given in this circular are faithfully carried out these justly dreaded diseases will not spread. Such being the fact the responsibility of those whose duty it is to carry them out is great.

A positive promise from the attending physician to the County Superintendent of Health, or to the municipal medical health officer, to see that the instructions are faithfully carried out would relieve the latter of responsibility.

The County Superintendent of Health or the municipal medical health officer should not fail to promptly furnish to both the attending physician and the householder in whose family either of the diseases mentioned in section 9 occurs a copy of these instructions.

Any further information desired will be cheerfully furnished.

RICH'D H. LEWIS, M. D.,
Secretary.

A copy of these instructions, together with a copy of the new law, was mailed to every registered physician in every county in North Carolina except four, from the Clerks of which no reply has been received to either of my two letters: I shall write them again.* The total number mailed so far is 1,517. The "instructions" in quantity will be sent to all County Superintendents and municipal health officers. With them will be sent the placards required to be posted on the front door of every house containing a case of either of the diseases mentioned in section nine.

---

*The list of physicians has been made complete, and the instructions were promptly distributed.

Continuing the plan of trying to educate the people in sanitary matters by popular articles in the newspapers, I sent an article, together with a copy of the Instructions for Quarantine and Disinfection, to every newspaper in the State with a request that they publish same.

Just on this line members of the profession can be of great assistance, provided they approve of the plan and the articles, by using their influence with the editors of their local papers to get them to publish them. A public sentiment favorable to sanitation must be built up if we expect to make any substantial progress. The Anglo-Saxon people of this free country cannot be driven to the performance of what they do not approve. They must be persuaded of the importance of these restraints upon their liberties under certain circumstances before they can be successfully imposed.

But the physicians of the State can be of much greater service to the cause of the public health in another way, and that is by giving to the law and the sanitary regulations imposed by it their own cordial support. Indeed the practical application of the law is in the hands of our medical men. If they give it their cordial support and urge its importance upon their patients it will be carried out, but if they are indifferent, and make light of and belittle it it will surely be largely of no effect. In view of the wholesale danger to life of the spread of contagious and infectious diseases, which can almost surely be prevented by the strict enforcement of sanitary regulations, this is no light responsibility which rests upon us, whether we are willing to assume it or not.

Section 19 of the law requires all State institutions before adopting a system of water supply and sewerage to consult the State Board of Health. In compliance with that requirement the President of the Board of Directors of the proposed School for the Deaf and Dumb at Morganton addressed the following letter to the President of the Board of Health:

BILTMORE, N. C., March 31, 1893.

Dr. Henry T. Bahnson, Salem, N. C.,

DEAR SIR:—I see that the Laws of 1893 make it the duty of the Board of Health of the State of North Carolina to consult and advise with all the State institutions already having or intending to introduce systems of water supply, drainage, or sewerage. The Board of the Deaf and Dumb School at Morganton are considering their water supply; we are considering two ways of furnishing same. One by gravitation, and to get it would have to lay a line of pipe about four miles at a cost of from $12,000 to $15,000, which is more money than the Board can pay if we can get that which will answer cheaper. We also have under consideration the "Gang Well" system, which, if it is thought it will work well and the quality of the water is all right, will be a great deal cheaper. This system we will have ample means of testing, as the Morganton Tannery is putting in a gang well on adjoining property to that of the institution. I do not think there will be a doubt as to quantity if the quality is what is desired. I go into the details so you can the better advise us, and to do this would be glad to have you with us at our next Board meeting on the 14th April. The sewage from the building will be conducted in the usual sewage pipe one-half mile from building, emptying into a creek with a fall of about one hundred and fifty feet.

Hoping to hear from you on the subject, or, better, see you at our meeting, I am very truly,

M. L. REID,
Chairman Board Deaf and Dumb School.

In accordance therewith a committee composed of Drs. H. T. Bahnson and S. Westray Battle visited Morganton, examined carefully into the matter and made the following report:

May 5, 1893.

To the Honorable Board of Directors
Deaf and Dumb School at Morganton, N. C.,

Gentlemen:—The committee appointed by the North Carolina Board of Health, in compliance with your request, to examine and advise your honorable body relative to a water supply and sewerage system for the Deaf and Dumb School at Morganton, N. C., beg to submit the following report:

A careful inspection of the site and surroundings has satisfied us that the sewage of the institution should be emptied directly into Hunting creek. The smaller stream to the rear of the school is objectionable on account of its limited water supply, and its liability to overflow *during freshets* and deposit the sewage on the lowlands in its course. The prevalent westerly winds would thence convey its unpleasant and perhaps noxious effluvia to the institution. Hunting creek furnishes so large a volume of water that this menace is entirely avoided, and a conduit in a direct line, with ample and uninterrupted fall, would cost very little more.

The water supply presents a more difficult problem. While there is no doubt in our minds that a pipe line from a mountain stream, whose water shed could be owned and protected by the authorities of the institution, would furnish the best and safest supply, the great cost practically prohibits its adoption. A system of gang wells has been successfully employed by the large tannery on the adjoining property, which furnishes very much more water than will ever be required by your institution. This water is apparently pure and the plant required an outlay of less than one-fourth of the amount which a pipe line from the mountain would cost.

The site in the rear of the school is apparently favorable for the adoption of a similar system. Water obtained here would probably be free from mineral impurity, and the danger of contamination is so remote that it can safely be left out of consideration.

Under the circumstances we cannot hesitate to recommend that an attempt be made to obtain a water supply from this source.

Very respectfully,
HENRY T. BAHNSON, M. D.,
S. WESTRAY BATTLE, M. D.,
Committee.

It needs no argument to prove that the greatest danger from contagious and infectious diseases is where numbers of people are congregated together in close quarters, and therefore that the machinery for combating them should be made as near perfect as possible in the cities and towns. To that end the organization of local municipal Boards of Health is a necessity. Section 25 of the law confers full powers upon all municipal corporations to make such regulations and impose such penalties for the preservation of the public health as they may deem necessary; but the matter is always optional with them. In the hope of inducing as many as possible to organize Boards of Health with the necessary powers, I have prepared the following letter to be sent to the Mayors of all towns of more than 500 inhabitants:

RALEIGH, N. C., May 8, 1893.

His Honor the Mayor,

DEAR SIR:—The warm weather is upon us and it is time for those of us upon whom rests the responsibility of looking out for the protection of the health of the people to be bestirring ourselves. Whenever there is a Board of Health organized it is clearly its duty; but otherwise, in cities and towns, it falls upon the Mayor and Board of Aldermen or Town Commissioners. It is best, however, to have a body whose special duty it is, and therefore it is expressly desirable that Boards of Health should be formed in all towns where they do not already exist. This is particularly the case just at this time, since the entrance of cholera into our country this summer is regarded as more than probable.

Have you a Board of Health in your town? If so, will you be kind enough to send in the names of its officers and a copy of its sanitary regulations? If not, will you not exert yourself to secure the formation of one as soon as possible? If desired, I would take pleasure in forwarding to you, free of charge, model ordinances, blanks, etc. Your aid in this important matter is asked in the interest of your own people, chiefly, but also for the sake of other citizens of the State who might incur disease from your town if the proper and necessary sanitary precautions are neglected.

Your kind attention will oblige,

Yours very respectfully,

RICH'D H. LEWIS, M. D.,

Secretary.

The subjoined letter, inclosing model ordinance, blanks, etc., was sent to every county-seat and other town of more than five hundred inhabitants:

RALEIGH, N. C., June 9, 1893.

The Honorable Mayor and Board of - - - - - - - - - ,

GENTLEMEN:—I send herewith a copy of the Act Relating to the Board of Health (Chapter 214, Laws of 1893), a model health ordinance, based chiefly on the admirable one issued by the Pennsylvania Board of Health, and various blanks which explain themselves. I hope that you will adopt and enforce them, thereby materially advancing the cause of public health and *pari passu* the prosperity of your town. The ordidance may strike you as being rather voluminous, but a careful consideration of the same will, I think, show the reasonableness and importance of each section. Still, if deemed necessary, it can be modified to suit the particular conditions of your town, though I would be glad to have it adopted as it stands in order to secure a uniform system in every town in the State.

In cities and towns where people are more or less crowded together, and the danger of contamination of air and drinking water and of the spread of communicable diseases from person to person is in consequence greatly increased, the practical application of sanitary laws is especially important. The collection of vital statistics, particularly those relating to the cause of death, should be carefully looked to in order to ascertain those most prevalent, with a view to taking special precautions against them in the future. It is also of great importance from a material point of view. One of the first inquiries made by intending immigrants is in regard to the healthfulness of their contemplated destination, and that information would be sought for at this office. To give an opinion I must be assured of their *completeness* and *accuracy*. Those two essentials cannot be obtained unless the method recommended is faithfully carried out, viz., the positive refusal to allow the body of any one dying in the town to be buried or removed without a permit from a designated official, based upon a properly filled out and signed death certificate giving the cause of death; or some other method equally as reliable. The healthfulness of our State is one of its greatest attractions, and the only way to demonstrate it to strangers in these days of scientific accuracy is by means of reliable vital statistics. In our present stage of sanitary development these statistics can only be obtained from our cities and towns, and I trust you will help your own immediate home and, at the same time, aid me in showing to the world our advantages in this most important item of health.

Any further assistance in my power would be most gladly rendered by,

Yours very respectfully,

RICH'D H. LEWIS, M. D.,

Secretary.

ORDINANCE OF THE -------------- -------OF------------- ------ FOR THE BETTER PRESERVATION OF THE PUBLIC HEALTH AND TO PREVENT THE SPREAD OF COMMUNICABLE DISEASES.

In virtue of the powers conferred by section 25, chapter 214, Laws of 1893 of the State of North Carolina, be it ordained by the[*]---------------- of the[†] -------- ---of------------ --, and it is hereby ordered by the authority of the same—

SECTION 1. That the Mayor[‡]-----------------shall constitute a Local Board of Health for the[†]-----------------of ------------, whose duty it shall be to faithfully execute all Laws of the State (chapter 214, Laws of 1893—An Act Relating to the Board of Health) and all ordinances relating to the public health of the[†]-------------of-------------. The Board of Health shall have power to make all necessary rules and regulations for the promotion and preservation of the public health and the collection and registration of vital statistics within the[†]--------------- of------------ ---subject to the ratification of the[*]--------------. A majority of the members shall constitute a quorum.

SEC. 2. The Mayor shall be *ex officio* President of the Board of Health. He shall convene the Board in regular session on the first[¶]------------ -- in each month from April to October inclusive, and quarterly thereafter, and shall have power to call the said Board together in extra session whenever, in his judgment or in that of the health officer, the public health demands it.

SEC. 3. The medical member[§] of the Board shall be *ex officio* the health officer of the[†]------ ------, and shall be the executive officer of the

---

[*] Insert City Council, Board of Aldermen or Board of Town Commissioners, as the case may be.

[†] City or Town.

[‡] *For small towns* insert "the Town Clerk and the County Superintendent of Health" (if that official is a resident of the town and acceptable to the town authorities), otherwise insert "the Town Clerk and a resident registered physician to be elected by the Board of Town Commissioners."

For larger towns insert "the Town Clerk and three resident registered physicians to be elected by the Board of Town Commissioners." If preferred insert "the Town Clerk and three other persons, one of whom shall be a resident registered physician to be elected, etc."

For cities insert "Chief of Police, City Attorney, Chairman of the Sewer Committee, Chairman of the Water Committee, Chairman of the Street Committee and County Superintendent of Health" (if he be a resident of the city), otherwise "a resident registered physician to be elected by the Board of Aldermen." Perhaps it might be better to insert after City Attorney "the County Superintendent of Health and three other resident registered physicians to be elected by the Board of Aldermen."

[¶] Insert day of week.

[§] Where there is more than one medical member of the Board substitute "The medical member of the Board receiving the highest number of votes shall be the health officer."

Board. He shall perform for the*------------------ the duties of the County Superintendent of Health as laid down in Chapter 214, Laws of 1893, and such other duties as may be imposed by the Board, including the collection of vital statistics, which he shall use every effort to make as full and accurate as possible, especially such as relate to the cause of death. He shall notify the Secretary of the State Board of Health of his election and shall make such reports and answer such inquiries concerning the sanitary condition of the†---------, diseases prevalent, vital statistics, etc., as may be required by the State Board of Health. He shall hold his office for----------------years, and until his successor is appointed and has qualified.

Sec. 4. The*--------------Clerk shall be *ex officio* Secretary of the Board. He shall keep a full and accurate record of all business done at its meetings. He shall cause to be published in the newspapers of the*---------- and by printed or written notices, to be posted in† ---------, all orders, rules and regulations of the Board, which publication shall be deemed legal notice of the same to all persons. He shall file and keep for reference all reports, complaints, orders or other papers relating to the business of the Board. He shall also keep, in a book provided for the purpose, a full and complete record in detail of all vital statistics.

Sec. 5. The Board of Health may, with the approval and consent of the Board of‡-------------elect a special¶ ----------------, or use one of the regular force, who shall be known as the Sanitary Inspector. He shall inspect at least once in every month, from April to October inclusive, the premises of every householder in the *--------------. He shall make a note of and report in writing to the health officer any violations of the orders, rules and regulations promulgated by the Board, and shall serve such legal notices as the Board may direct. His term of office and compensation shall be fixed by the Board of‡----------.

Sec. 6. The Board of Health, through its health officer, shall make a report annually in March, for the preceding twelve months ending with the last day of February, to the Board of‡-------------.

Sec. 7. Whatever is dangerous to human life or health, whatever renders the air or food or water or other drink unwholesome, and whatever building, erection, or part or cellar thereof, is overcrowded or not provided with adequate means of ingress and egress, or is not sufficiently supported, ventilated, drained, cleaned or lighted, are declared to be nuisances, and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of this ordinance, and also be liable for the expense of the abatement and remedy therefor.

---

*City or Town. †Insert number and location of public places.

‡Town Commissioners or Aldermen. ¶Constable or policeman.

SEC. 8. No house-refuse, offal, garbage, dead animals, decaying vegetable matter or organic waste substance of any kind shall be thrown on any street, road, ditch, gutter or public place within the limits of this ---------, and no putrid or decaying animal or vegetable matter shall be kept in any house, cellar or adjoining out-building or grounds for more than twenty-four hours.

SEC. 9. No person or persons without the consent of the Board of Health* shall build or use any slaughter-house within the limits of this ------------, and the keeping and slaughtering of all cattle, sheep and swine and the preparation and keeping of all meat, fish, birds, or other animal food, shall be in the manner best adapted to secure and continue their healthfulness as food; and the keeping of the premises shall be with such care and cleanliness as not to endanger the public health. No meat, fish, birds, fowls, fruit, vegetables, milk, and nothing for human food not being then healthy, fresh, sound, wholesome, fit and safe for such use, nor any animal or fish that died by disease or accident, and no carcass of any calf, pig or lamb which at the time of its death was less than four weeks old, and no meat therefrom, shall be brought within the limits of this------------, or offered or held for sale as food anywhere in said------------.

SEC. 10. No person or company shall erect or maintain within the limits of this ------------any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive or deleterious odors, gas, smoke, deposit or exhalations are generated, such as tanneries, refineries, manufactories of starch, glue, leather, chemicals, fertilizers, gas, etc., without the permit of the Board of Health,* and all such establishments shall be kept clean and wholesome so as not to be offensive or prejudicial to public health.

SEC. 11. The keeper or keepers of a livery or other stable shall keep his or their stable-yard clean, and shall not permit, between the first day of April and the first day of November, more than----------loads of manure to accumulate in or near the same at any one time except by express permission of the Board of Health.*

SEC. 12. No pig-pen shall be built or maintained within the limits of this --------------without a permit from the Board of Health,* or within one hundred feet of any well or spring of water used for drinking purposes, or within thirty feet of any street or of any inhabited house, or unless constructed in the following manner, viz., so that the floor of the same shall be not less than two feet from the ground in order that the filth accumulating under the same may be easily removed; and such filth accumulating in, about and under the same shall be removed at least once a week, and oftener if so ordered, and on the failure of any owner or occupier of such premises so to do, then the same shall be done by the ------ -- ---.

---

*Where there is no Board of Health organized substitute "Board of Town Commissioners" or "Board of Aldermen."

SEC. 13. No privy-vault, cess-pool or reservoir, into which a privy, water-closet, cess-pool or stable or sink is drained, shall be constructed, dug or permitted to remain within the corporate limits of this-- -- ---. Earth privies and earth closets, with no vault, pit or depression below the surface of the ground, are allowed, but sufficient dry earth or ashes must be used daily to absorb all the fluid part of the deposit, and the contents must be completely removed at least once every month.*

SEC. 14. The following diseases are declared to be communicable and dangerous to the public health, viz.: small-pox (variola, varioloid), cholera (Asiatic or epidemic), scarlet fever, (scarlatina, scarlet rash), measles, diphtheria (diphtheritic croup, diphtheritic sore throat), typhoid fever, typhus fever, yellow fever, spotted fever (cerebro-spinal meningitis), epidemic dysentery, hydrophobia (rabies) and glanders (farcy), and shall be understood to be included in the following regulations, unless certain of them only are specified.

SEC. 15. Whenever any householder knows that any person within his family or household has a communicable disease, dangerous to the public health, he shall, within twenty-four hours, report the same to the health officer,† giving the street and number or location of the house.

SEC. 16. Whenever any physician finds that any person whom he is called upon to visit has a communicable disease, dangerous to the public health, he shall, within twenty-four hours, report the same to the health officer,† giving the street and number or location of the house, on the receipt of which report the health officer shall immediately notify the school committee of the public school, the superintendent of the graded school and the principals of private schools within the limits of this ---------------, at the same time calling their attention to Section 13, Chapter 214, Laws of 1893.

SEC. 17. No person shall, within the limits of this -----------, unless by permit of the health officer,‡ carry or remove from one building to another any patient affected with any communicable disease dangerous to the public health. Nor shall any person, by any exposure of any individual so affected, or of the body of such individual, or of any article capable of conveying contagion or infection, or by any negligent act connected with the care or custody thereof, or by a needless exposure of himself or herself, cause or contribute to the spread of disease from any such individual or dead body.

---

*To towns and cities having already or about to introduce a system of sewerage suggestions as to the proper ordinances will be gladly furnished by the Secretary of the State Board of Health.

†Where there is no medical health officer insert "County Superintendent of Health," as required by chapter 214, Laws of 1893.

‡Where there is no Board of Health insert "County Superintendent of Health."

SEC. 18. There shall not be a public or church funeral of any person who has died of Asiatic cholera, small-pox, typhus fever, diphtheria, yellow fever, scarlet fever or measles, within the limits of this-------- and the family of the deceased shall in all such cases limit the attendance to as few as possible, and take all precautions possible to prevent the exposure of other persons to contagion or infection; and the person authorizing the public notice of death of such person shall have the name of the disease which caused the death appear in such public notice.

SEC. 19. No person shall let or hire any house, or room in a house, in which a communicable disease, dangerous to the public health, has recently existed, until the room or house and premises therewith connected have been disinfected to the satisfaction of the Board of Health,* in accordance with the "Instructions for Quarantine and Disinfection" furnished by the Secretary of the State Board of Health; and for the purposes of this section the keeper of a hotel, inn, or other house for the reception of lodgers, shall be deemed to let or hire part of a house to any person admitted as a guest into such hotel, inn or house.

SEC 20. Members of any household in which small-pox, diphtheria, scarlet fever or measles exists shall abstain from attending places of public amusement, worship or education, and from visiting other private houses except on express permission of the health officer.*

SEC. 21. The clothing, bed-clothing and bedding of persons who have been sick with any communicable disease, dangerous to the public health, and the articles which they have used and the rooms which they have occupied during such sickness shall be disinfected under the direction of the Board of Health* in accordance with the "Instructions for Quarantine and Disinfection" furnished by the Secretary of the State Board of Health.

SEC. 22. Upon the appearance of a case of small-pox in†------------ county it shall be the duty of every adult and every parent, guardian or master of every minor residing within the limits of this‡------ ------, who has not had small-pox or been vaccinated so as to have taken cowpox regularly, to be, if an adult, vaccinated, or in the case of a minor, to cause such minor to be vaccinated within two weeks after the appearance of such case of small-pox unless unable to do so by reason of poverty; and it shall be lawful for any registered physician residing in this[*] ------ ------, on application of such resident adult, or parent, master or guardian of such resident minor, as is unable by reason of poverty to pay the vaccination fee, to vaccinate said adult or said minor and present his bill therefor, properly authenticated, for an amount not exceeding the fee usually charged for such services, and to recover the same of and from the corporation.[†]

---

*Where there is no Board of Health insert "County Superintendent of Health."

†Insert name of county in which town or city is situated, or if preferred substitute "within a radius of.................miles."

‡City or town.

Sec. 23. Every undertaker or other person who may have charge of the funeral of any dead person shall procure a properly filled out certificate of the death and its probable cause, in accordance with the form prescribed by the State Board of Health (no other to be valid), and shall present the same to the designated officer or member of the local Board of Health and obtain a burial or transit permit thereupon at least twenty-four hours before the time appointed for such funeral or removal; and neither he nor any other person shall remove any dead body until such burial or transit permit shall have been procured.

Sec. 24. Every person undertaking preparations for the burial of a body dead from communicable disease as hereinbefore enumerated shall adopt such precautions as are set forth in the "Instructions for Quarantine and Disinfection," furnished by the State Board of Health, to prevent the spread of such disease.

Sec. 25. Every physician or midwife attending or present at the birth of any human being within the ------shall, within twenty-four hours thereafter, certify the same to the health officer[‡] upon blanks prescribed by the State Board of Health to be furnished by said health officer. In case there be no attending physician or midwife, then the next of kin or other person present at such birth shall, within twenty-four hours thereafter, report the same to the health officer, who shall then have the proper blank filled out.

Sec. 26. All physicians, midwives and undertakers practicing or doing business in this ------------shall register their names and addresses with the Secretary of the Board of Health[¶] within thirty days after the promulgation of this ordinance; and hereafter within ten days after beginning practice or business.

Sec. 27. Such pertinent portions of chapter 214, Laws of 1893, as are not included in the above sections are hereby adopted as a part of this ordinance.

Sec. 28. Every person violating any section of this ordinance shall be liable for every such offense, upon conviction before the mayor or other justice of the peace, to a fine of not less than $3 nor more than $25, or imprisonment for not more than ten days, at the discretion of the convicting justice, besides costs, which he may inflict in addition if he see fit.

---

[*] City or town.

[†] If preferred the vaccination of paupers might be required of the health officer, where there is one, the town furnishing the virus, or the fee might be fixed in advance by agreement with the physicians. The vaccination of the people is of the highest importance and every effort should be made to accomplish it. The amount of raw material ready to be worked up by small-pox in this State is simply appalling.

[‡] Where there is no health officer substitute "City or Town Clerk."

[¶] Where there is no Board of Health substitute "City or Town Clerk."

BIRTH CERTIFICATE.

------------------N. C., ------------------189--
Date of Birth--
Name of Child, if named ------------------------------
Name of Father ---------------------------------------
Name of Mother---------------------------------------
Residence, No. -------------------Street ----------------Ward
Color ----------------------Sex --------------------------
Condition of Child--------------------------------------

Attending Physician or Midwife --------------------------

CERTIFICATE OF DEATH AND APPLICATION FOR BURIAL OR TRANSIT PERMIT.

To the* -------------------of-------------------N. C.:
Date of Death --
Full Name of Deceased†---------------------------------
Sex, Male or Female -------------------------------------
Age ------------Years ------------Months ------------Days.
Color --
Married, Single, Widow or Widower ----------------------
Occupation ---
Birthplace--
Place of Death, No. ------, ------------Street, ----------Ward.
Cause of Death ---------------------------------------
Duration of Last Sickness------------------------------
Place of Burial--------------
Date of Burial -------------- ----------------------- M. D.,
Medical Attendant.
Undertaker --------------
Place of Business-------------- ‡-----------------------

Personally appeared before me on this the ------day of------------189--
---------------------------- and made oath that the above statement in regard to the death of------------------------is true.

------------------------------, J. P.

---

*This certificate must be returned to the official selected for the purpose—Town Clerk, Chief of Police or some other—for Burial Permit.

†If still-born, give names of parents on this line.

‡In case there was no medical attendant, this certificate may be signed by the Health Officer, after careful inquiry as to the facts required to be noted. Or it may be signed on oath before a Justice of the Peace by the householder in whose house the death occurred, or by the next friend of the deceased who was present. Where there was an attending physician no other signature than his should be accepted.

NOTE.—The apparent amount of "red tape" in this certificate in the matter of requiring the householder or next friend to make oath before a Justice of the Peace is rendered necessary by the fact that death certificates are often used in the courts as evidence, and the disposition of large sums of money may depend upon their accuracy and reliability.

No. ----------

Date ---------------------- 189--

Name ----------------------------

Age --------Sex --------Color ------

Date of Death --------------------

Cause of Death -------------------

Place of Death -------------------

Date of Burial -------------------

Place of Burial or Destination --------

Undertaker -----------------------

Place of Business -----------------

The Superintendent or other person in charge of the cemetery designated in this permit shall sign and return the same to this office on or before the Saturday following its issue.

Respectfully returned,

Supt. ------------------------ Cemetery.

No. ------------

BURIAL PERMIT.

This permit must in all cases accompany the body to its destination.

------------ Department.

-------------- N. C., ------------ 189--

Permission is Hereby Given to remove the remains of ------------

Date of Death ------------ 189--; age ---- yrs. ---- mos. ---- days.

Place of Death --------------------------------

Cause of Death --------------------------------

Date of Burial --------------------------------

Place of Burial or Destination ------------------ Color ------

To ------------------------------ Cemetery for Interment.

To ------------------------------ Company for Transportation.

Undertaker ------------------------------------

Place of Business ---------- (The Designated Officer) ----------

FORM FOR SANITARY INSPECTION OF CITIES AND TOWNS.

1. Inspection-books are furnished as per Form No. 1.

2. The Inspector is presumed to have received intelligent drilling from the Health Officer in the many features of unsanitariness which will be met with, and is moreover, presumed to be a person of good judgment and discretion, and to have a high standard of sanitary methods, with his heart in the work.

3. The inspection districts having been designated by the Board, the Inspector begins work at a set point and makes an entire inspection of the district house by house, block by block, noting down the conditions in Inspection-book as provided under manner of Form No. 2.

4. Should any bad features exist the Inspector is to point out to the householder where the remedy can be applied and the necessity for it, and to leave upon the premises the notice of Form No. 3. Should the existing conditions be not really bad, but clearly not good, the Inspector is required to inform the householder where the defect lies, and to urge upon him the benefits resulting from thorough cleanliness.

5. After each inspection district has been gone over Inspector should make a report to the Health Officer or Mayor of total inspections and their results upon Form No. 4: this to be kept on file by the Secretary of Board for future comparisons.

6. A space of nine lines should be given to each lot in order that the record of the whole number of inspections made during the year (monthly from April to October, inclusive, and quarterly thereafter) may be arranged for easy comparison. The Inspector should not only call attention to violations of the sanitary rules and regulations and note bad conditions, but he should make it a point to encourage those who are evidently trying to do their sanitary duty.

7. At stated intervals a notice should be given through the public press of what the comparative results show, thereby enlisting an interest in the work from those who might not be reached by other means.

Although modified by myself in some respects, the credit for these forms is due to Mr. Alfred V. Wood, Secretary of the Board of Health of Brunswick, Ga., a brother of our late deeply lamented Secretary, and a sanitary expert.

FORM NO. 1.

SAMPLE PAGE OF INSPECTION BOOK.

1893–'94.			1	2	3	4	5	6	7	REMARKS.
April	1	124 Wolf Street,	b	a	a	b	c	a	a	1. Too much litter and trash, 5. Very foul.
May	3	" "	a	a	a	a	b	a	a	5. Improved, but not clean yet.
June	2	" "	a	a	a	a	a	a	a	
July	2	" "	b	a	a	a	b	a	a	1. Rank weeds. 5. Not enough dry earth used.
Aug.	1	" "	a	a	a	a	a	a	a	
Sept.	2	" "	b	a	a	a	a	a	a	
Oct.	1	" "	a	a	a	a	a	a	a	
Jan.	3	" "	a	a	a	a	a	a	a	
April	1	T. H. Jones,	c		c		x		b	1 & 3. Dirty pig-pen too near well. 5. Very foul, never cleaned.
May	3	" "	b		b		a		b	1. Pig-pen improved, floor raised, so that can be raked under.
June	2	" "	a		a		a		b	
		And so on down.								

NOTE.—By allowing nine lines to each lot there will be a line for each one of the inspections required by the ordinance—monthly from April to October, inclusive, after. "124 Wolf Street" represents a complete establishment, "T. H. Jones" an humbler one with no stable or other out-building and no sink.

The Inspector should carry this book with him when making his rounds and make his notes on the spot.

FORM NO. 2.

(To be printed or written on first fly-leaf of Inspection Book).

Column No. 1 indicates condition of Premises [other than below].
" " 2 " " Stable.
" " 3 " " Well or Pump.
" " 4 " " Sink.
" " 5 " " Privy.
" " 6 " " Out-building.
" " 7 " " Residence.

A indicates Good. B indicates Fair. C indicates Bad. X indicates a serious menace to health.

FORM NO. 3.

SANITARY INSPECTION DISTRICT No.____________

______________________________189__

Mr.____

No.______ , ________________________Street.

Your premises are found to be in a very unsanitary condition, so much so that it endangers the public health. You will take notice that you will be reported to the*______________________________________ unless this condition is bettered before my next visit.

______________________________Inspector.

---

*Health Officer or Mayor.

☞ To be sent on the first day of each month for the month preceding to the Health Officer or Mayor.

FORM NO. 4.

SANITARY INSPECTION DISTRICT No. ----------

Month of-------------------189--

No. Inspections Made.	No. Fair Condition.	No. Bad Condition.	No. Requiring Immediate Attention.

Remarks: --

------------------------------------Inspector.

DISCUSSION.

Dr. Thomas stated for the information of those living in the eastern part of the State that the Quarantine Station to be built at Southport was intended to be a relief station for all that part of the State, so that if any vessel came to any port where the port officer felt he did not have the provisions for properly caring for her she could be sent to the station at Southport. As a representative of the Quarantine Board he felt especially under obligations to the State Board of Health. To accomplish this work has been a thing long hoped for. Many visits have been made to the Legislature in their efforts to gain the assistance of the State. Practically all the stations south of us are provided with stations of approved pattern. They believe that only superheated steam is a safe disinfectant for the baggage and clothing of passengers and crews of infected ships, and such an apparatus will be erected at the Cape Fear Station. Notwithstanding the cavils of the laboratory men sulphur will still be used for disinfecting the holds of vessels. It has been so effective thus far that no vessel which has been disinfected with sulphur and washed with bichloride solution has been known to carry contagion. He invited members of the Society to visit the Station after its completion and see it in operation.

Dr. Reagan deprecated the lack of interest on the part of members in the Conjoint Session, and thought this lethargy must be overcome before we can expect to excite the interest of the legislators and the laity.

Dr. H. W. Lewis said it would take the stimulus of an epidemic to create an interest in sanitary matters among the physicians of his county. In making his reports as Superintendent of Health he had to depend almost entirely upon his own practice in enumerating the prevailing diseases. He thought the law, while probably as good as could be obtained, was defective in not making provision for the remuneration of Superintendents for their extra and especial services in case of epidemics. He understood the law to only give the Superintendent the right to charge for his visits to the poor-house and jail. (The Secretary explained that it gave him the right to demand the fees usual in his county for any services he might render). He regretted there had been no legislation in regard to vaccination. His county was raising a large crop for the Reaper should an epidemic of small-pox appear.

The Secretary stated that in regard to vaccination the Conference were in accord as to the desirability of compulsory vaccination, but that such a clause in the bill would have jeopardized the whole bill. People cannot be driven in these matters. In this connection he referred to some remarks made by Dr. Lewis at the last meeting, when he stated that he had appointed a day on which to vaccinate the pupils at a county school, and when he arrived there he found that all the school had taken flight.

The Secretary announced that the terms of office of himself and Dr. Bahnson expired with this meeting, and that under the new law these vacancies would be filled by the Governor's appointment.

There was some discussion as to whether it would be proper for the Society to recommend candidates for appointment, but it was the sense of the meeting that it should be left for the Governor to ask for such recommendation should he desire it.

The Secretary called the attention of Superintendents of Health to the fact that it is now made obligatory on him to notify the County Commissioners of the failure on the part of the Superintendents to make their reports. He also urged upon physicians to attend the meetings of the Board of Health for the election of Superintendents that proper men may be selected for these positions.

On motion the Conjoint Session adjourned.

RICH'D H. LEWIS, M. D.,
Secretary.

CONJOINT SESSION AT GREENSBORO, MAY 15, 1894.

At 12 M. the Board met in conjoint session with the State Medical Society, President Bahnson in the chair.

Passed Assistant Surgeon Jos. J. Kinyoun, of the United States Marine Hospital Service, having accepted an invitation of the President of the Board to attend the meeting, was upon motion invited to a seat upon the floor and to participate in the discussions. He acknowledged the courtesy in an appropriate manner.

The Secretary then read his annual report as follows:

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

By Richard H. Lewis, M. D., Raleigh. N. C.

When your Secretary made his last annual report the sanitary sky to the eastward was overcast with the dark and lurid clouds of cholera. There was in the minds of people at large to some extent, but more especially of those whose duty it was to stand as sentries upon the watch-towers, a feeling of apprehension lest these threatening clouds should reach our shores and deluge us with the dreaded pestilence.

Later yellow fever appeared at Brunswick, Ga., almost at our doors, and our health officers on our seaboard, particularly at our port of Wilmington, had their anxieties greatly increased. Still later small-pox began to spread over the country and is not yet, we regret to admit, stamped out.

Notwithstanding these valid grounds for uneasiness our fears have not been realized. We have to felicitate ourselves and the people of our State and generally of our whole country upon their escape. And in doing so we should make our acknowledgments to the United States Marine Hospital Service for its excellent management in keeping cholera (except one case at Jersey City) out of our country and in practically bottling up the yellow fever at and near Brunswick.

In making this report your Secretary does not consider it necessary to read all the *data* bearing upon what has been done, but will be more general in his method and refer those interested to the archives of the Board where they can be found and consulted.

On June 20th a circular-letter was sent to the Mayors of all county-seats and all other towns and cities of 500 or more inhabitants, reminding them of the sanitary suggestions previously made to them and referred to in my last report, enclosing copies of a model health ordinance, death certificate, burial permit, birth certificate and other sanitary blanks, and begging them to make necessary provision for the protection of the lives and health of their people and for securing more reliable vital statistics.

An editorial on this subject, giving this letter and also another addressed to the physicians residing in the above noted towns and cities urging them to interest themselves in this matter and do all in their power to induce the municipal authorities to take action—chiefly by organizing local Boards of Health—was published in the June Bulletin. While the result was not at all flattering some of the seed fell on good ground. Salisbury and Oxford adopted the model ordinance—exactly as recommended—and other towns, we have reason to believe, were induced by it to improve their methods—particularly this goodly town of Greensboro.

The following will show in detail what was done:

On July 9th I received a letter from Dr. Leinster Duffy, Superintendent of Health of Craven county, informing me that an epidemic of typhoid fever of an extremely malignant type was prevailing in the neighborhood of Core Creek and asking if any arrangement existed for the special investigation of such cases. His letter was promptly referred to the President of the Board, who appointed Dr. W. H. Harrell, a member of the Board, to visit Core Creek and investigate the matter. Dr. Harrell responded and made the following report:

Dr. Richard H. Lewis, Secretary of the North Carolina State Board of Health, Raleigh, N. C.,

DEAR SIR:—By order of the President I visited Core Creek, Craven county, as the representative of the State Board of Health, and make the following as my report: In company with Dr. Leinster Duffy, County Superintendent of Health for Craven county, I examined the premises of a number of householders where typhoid fever existed in an epidemic form. There have been 36 cases and 13 deaths out of a population of about 150. I found that no regard whatever had been paid to sanitation, notwithstanding the repeated warnings and instructions from the attending physicians. Discharges from the bowels had been emptied in the yards near the wells; whole families had used the same drinking utensils that the patient used, and no effort had been made to clean the yards, protect the water supply or to isolate the patient. Patient, family and visitors drank out of the same dipper, soiled clothes were allowed to stay in the room for a considerable time and then be washed at the well. Carelessness and negligence of the grossest and most reprehensible form has produced in a small village a severe and fatal epidemic. I suggested that the wells be not used at all; that driven pumps be substituted: that the drinking water be filtered or boiled, or both; that the premises be thoroughly cleaned, limed and drained; that all bedding be aired and disinfected, and that all intestinal discharges be sterilized and buried deeply at a distance from all wells and houses. I am indebted to Drs. Duffy and Whitaker, of Trenton, for assistance in the investigation, and for their personal attendance. There can be no blame attached to the attending physicians in the matter, as they had repeatedly insisted that all the above suggestions be carried out. They did not have the co-operation of the people, therefore could do nothing. I was assured by the best people of the community that all means suggested above would be used to stop the spread of the disease so far as it was in their power.

Yours, etc.,

W. H. HARRELL.

In consequence of this severe epidemic at Core Creek and the rather wide-spread prevalence of the disease it was thought well to call attention in the July Bulletin to the great importance of every physician's carrying out or seeing carried out the recommendations made in section 21 of the law in regard to the disinfection of the *dejecta* of typhoid fever before being emptied.

On July 14th a telegram was received from Surgeon General Wyman, M. H. S., asking for the facts in regard to the report of cholera in Northampton county that had appeared in the letter of a newspaper correspondent. During the day similar inquiries were made of the Secretary by parties as far distant as Ohio.

Having heard nothing from Dr. H. W. Lewis, the Superintendent of Health of Northampton county, I felt satisfied that the report was a mere rumor. But to settle the matter I immediately wired Dr. Lewis for the truth. I received the following reply:

> No cholera or disease resembling it here. I reported some dysentery in the county, and a few have died in Rich Square and Gaston townships. I have not seen a fatal case in this community.
>
> H. W. LEWIS.

A letter from Mayor Ellis, of Newbern, asking my opinion and the views of the Board of Health in regard to privy sinks, was received July 1st. A reply was sent expressing the opinion that, looked at from a sanitary point of view, they were utter abominations and should be condemned and abated at the earliest possible moment.

On July 15th a communication was received from Dr. Julian M. Baker, of Tarboro, announcing the sudden appearance in the town of eight or ten cases of typhoid fever without any manifest cause and requesting that a member of the State Board of Health be sent there to investigate the matter. In accordance therewith, Dr. Hodges not being able to go on account of sickness in his family, the writer was sent by the President.

Upon arrival at Tarboro a conference was held with the Mayor and the local profession. A statement of the facts and an expression of opinion was asked of each one. The facts were that twenty-seven cases had occurred up to that time, the first about a month before. That in some instances the fever was not typical. That it was not particularly malignant, although five had died. That the drinking water was obtained from ordinary wells as a rule, while those using cistern water did not restrict themselves to that. That the main street of the town was sprinkled with water pumped into mains from Hendrix creek, and that the same was used by some drug stores for washing soda-water glasses, etc. That a case of typhoid fever had occurred on the watershed of said creek during the preceding winter. That in nearly every instance typhoid fever had occurred on the same lot within a few years previous and that the undisinfected dejections had been thrown out upon the surface of the ground or emptied into the ordinary privy—which is the same thing. That about the time of the beginning of the epidemic the water in the wells was rather low from drought.

Samples of the water from Hendrix creek and from the two wells most in evidence were sent to the State Experiment Station for chemical analysis, and, Surgeon General Wyman, of the Marine Hospital Service, having at my request promised to have bacteriological tests made, to Washington also. Unfortunately the threatenings of cholera at the port of New York and the yellow fever at Brunswick so occupied the department, taking the bacteriologist of the service, Dr. Kinyoun, out of his laboratory, among other things, that the latter examinations could not be made. The water, however, was promptly analyzed chemically, and while the water from the creek, which no one drank, proved to be objectionable, that from the wells was better and fairly good drinking water. So that no manifest explanation of the prevalence of the fever could be obtained. The theory most plausible to my mind, after carefully considering the facts, was that the town was suffering the consequences of former sanitary sins—that the undisinfected discharges of former cases had poisoned the soil; that certain subtle conditions favorable to the development of the germs of the disease were apparently present, judging from its unusual prevalence in very numerous localities; that the bacilli had reached the wells and being relatively more abundant on account of the low water had produced their legitimate results.

In the way of recommendations it was suggested that the wells should all be thoroughly cleaned out and that the water drank should be first boiled. Also that the town should be thoroughly cleaned. And finally the attention of the physicians was called to section 21 of the act relating to the Board of Health, requiring the disinfection of all typhoid fever *dejecta* before being emptied, and the importance of its observance emphasized and illustrated by the prevailing condition of affairs. I was informed by Dr. Williams, the Superintendent of Health, that the suggestions made were carried out and that no more new cases occurred—whether *post hoc* or *propter hoc* we will not say.

COUNTY BOARDS OF HEALTH.

One of the wisest provisions of our new law is that requiring the Secretary of the State Board to notify by mail all persons eligible to membership in the County Boards of Health, of the time and place of meeting for the election of County Superintendent. In the Act of 1885 no provision was made for calling these meetings, and it being the business of no one in particular, it was frequently not done. In consequence the meetings in the counties that had organized auxiliary Boards were irregular as to time and sparsely attended as to members, while in counties having no Boards it was very difficult to start them. In performance of the duty laid on me by section 8 I sent notices to all those eligible to membership, both medical and lay, in the sixty-seven counties having Boards of Health and to those in the twenty-nine counties having no Boards, respectively. In the notice to physicians I thought it best not to confine myself to a bare notification of time and place, but to take advantage of the opportunity afforded to urge upon them the importance in the one case of attending the meeting of their County Board and in the other of assembling and organizing a Board in order that they might exercise the privilege conferred upon them by the State of selecting their health officer.

The result was very gratifying. The attendance in the counties already having Boards was in nearly every instance much larger and more interest was shown than ever before. In the other counties sixteen new Boards were organized and Superintendents of Health elected, making the total number of Superintendents eighty-three, as against sixty-seven before. Although much encouraged your Secretary was not satisfied, and so sent on September 20th a letter to the Chairman of the Board of Commissioners of each county that had failed to comply with the law urging them to elect a Superintendent of Health.

As a result of this five more Superintendents were elected by the Boards of Commissioners, leaving still seven counties with no legal health officer. A third letter was sent to each of these Boards and as a result two more Superintendents were elected, so that at present we have a total of 91 counties out of 96 with an official representing the sanitary interests of the people. The counties still unprovided for in this respect are Camden, Currituck, Hyde, Pamlico and Washington. It is earnestly hoped that ere another year rolls around they will take their proper place in the health procession.

YELLOW FEVER.

In the *Wilmington Messenger* of September 6th there appeared a communication signed J. H. Sykes, dated September 5th, stating that he had been informed by a gentleman from French's Creek, Bladen county, that a woman coming from Brunswick, Ga., between two and three weeks previously had just died, after an illness of forty-eight hours, of what was pronounced by Dr. Lucas, of our Board, the attending physician, yellow fever. On the same day telegrams were received from Mr. Harris, Acting Mayor of Wilmington, asking for information, and from Dr. Thomas, of our Board, giving the substance of the communication and asking if he should investigate the matter. In view of his proximity to Bladen county and the difficulty of reaching Dr. Lucas by wire he was requested to do so. With characteristic promptness and energy he managed the investigation and the next day received a statement from Dr. Lucas to the effect that the person referred to "did not die of yellow fever." After a sickness of nearly two weeks "she died with typho-malarial fever. * * * It is currently reported that she had yellow fever, but it is false." So the threatened panic was at once nipped in the bud.

On September 24th I received a letter from Supervising Surgeon General Wyman, of the Marine Hospital Service, enclosing "a newspaper clipping relative to an alleged occurrence of yellow fever aboard a vessel from Wilmington, N. C." The letter was referred to Dr. Geo. G. Thomas, Secretary Quarantine Board, Port of Wilmington, as well as a member of our State Board of Health, for answer. From his reply now on file in the Secretary's office it appears that the disease alluded to was evidently malarial.

On the same day a written request was received from Dr. J. W. McGee, Physician to the Pentitentiary, requesting me to officially visit the Penitentiary and aid the authorities in investigating the cause of an outbreak of fever, malarial and typhoid, made up of 41 and 21 cases respectively, inside the prison. A careful investigation explained satisfactorily the malarial fever as due to digging from a bottom and working in clay for making bricks, but the cause of the typhoid was not satisfactorily arrived at. All but five of the typhoid cases worked in the same bottom and drank from a spring and may have been poisoned there. The first inquiry was of course as to the prison drinking water, but there was not the slightest superficial evidence of its possible contamination and it was not feasible to have a bacteriological examination made at the time. It could hardly have been that, for the reason that all the prisoners were served with exactly the same water, and while most of the fever cases had been at work outside, there were five who had not gone beyond the walls. four of which five worked in the machine shop. There were no unsanitary conditions about this shop and we had to give it up. There were two deaths.

In compliance with the duty imposed upon the Secretary in section 16 of the Health Law in connection with the transportation of the bodies of persons who had died from contagious diseases enumerated in section 9 of the same act, I prepared and distributed to all of the common carriers in the State, according to a list kindly furnished by the State Railroad Commission, the following circular:

DIRECTIONS FOR DISINFECTING AND ENCASING DEAD BODIES.

Laws of 1893, Chapter 214, Section 16.

"No railroad corporation or other common carrier or person shall convey or cause to be conveyed through or from any city, town or county in this State the remains of any person who has died of small-pox, measles, scarlet fever, diphtheria, typhus fever, yellow fever, or cholera, until such body has been disinfected and encased in such manner as shall be directed by the State Board of Health, so as to preclude any danger of communicating the disease to others by its transportation; and no local registrar, clerk or health officer, or any other person, shall give a permit for the removal of such body until he has received from the Board of Health of the city, or from the Board of Aldermen or Town Commissioners, or the County Superintendent, of the city, town or county where the death occurred, a certificate stating the cause of death and that the said body has been prepared in the manner set forth in this section; which certificate shall be delivered in duplicate to the agent or person who receives the body, and one copy shall be pasted on the box containing the corpse; said certificate shall be furnished in blank by the transportation company when no local Board of Health exists." * * *

DIRECTIONS.

The body of a person dying of either of the diseases enumerated above must, before acceptance for transportation by any railroad corporation or other common carrier in this State, be enveloped, so completely as not to leave any portion of the body whatever exposed, in a sheet thoroughly saturated (dripping wet) with a solution of bichloride of mercury of not less strength than one ounce of the mercury to one gallon of water. And it shall likewise be encased in an air-tight metallic or metal-lined casket, hermetically sealed and enclosed in a tight wooden box of good strong stuff free from knots and cracks, of not less than one inch in thickness.

The death certificate and transportation permit required by section 16, above quoted, shall have printed thereon these directions and the affirmation duly signed by the proper official that they have been carried out.

RICH'D H. LEWIS,
Secretary.

The railroads seemed to approve the regulation. Col. W. A. Turk, G. P. A., R. & D. R. R., sent copies of the forms he was having prepared for any correction that they might be sure to conform to the law.

On November 1st I received a letter from Dr. R. L. Payne, Jr., Superintendent of Health of Davidson county, asking "the usual interpretation of certain points," those points being: 1. Should the Superintendent be paid for his services in quarantining and disinfecting by the householder or by the public authorities? 2. If the latter, the patient being in a municipal corporation, whether by the said municipality or by the county? I replied to the effect that the expense of quarantine and disinfection laid upon the householder by the law did not mean the pay of the health officer, and that unless the municipality for its better protection had created its own special Board of Health with its own health officer to perform for itself the duties of the County Superintendent it was clearly the duty of the county. Submitting Dr. Payne's letter and my reply to Attorney General Osborne, he gave me the following opinion:

RALEIGH, N. C., November 11, 1894.

Dr. R. H. Lewis, Secretary North Carolina Board of Health, Raleigh,

DEAR SIR:—In reply to your question concerning the payment for the services of the County Superintendents of Health I take great pleasure in stating that I agree with you entirely in your construction of the statutes on that subject passed by the last Legislature. I understand your opinion to be that the county, and county alone, pays for the services of the County Superintendent of Health, and not the householder nor the town, when the services are performed in a town. As I stated before, I agree with you, and the construction seems to me too clear for debate. Yours respectfully,

F. I. OSBORNE,
Attorney General.

The County Commissioners, after reading this opinion, said it was not worth any more than the opinion of any other lawyer, and that they would rely upon that of their own attorney, which was that the Superintendent should be paid by the householder. Dr. Payne, however, took a firm stand, declining to make any agreement with them as to definite salary and proposing by charging full fees for the regular duties of County Physician and for services in the matter of quarantine and disinfection to paupers to obtain a fair remuneration for his work, in consequence of which the Commissioners agreed to pay him a reasonable salary.

Dr. J. A. Hodges, owing to removal from the State, resigned from the Board, thereby depriving us of an active and interested member. After consultation with the President it was thought best, in order to avoid the expense of a special meeting for the purpose, to have the members signify their choice of his successor by letter to the Secretary. That course was taken and Dr. John Whitehead, of Salisbury, was unanimously elected to fill the vacancy. The letters are on file in the office of the Board.

Dr. J. T. Smith, Superintendent of Health of Perquimans county, one of the leading physicians of his county and a worthy Christian gentleman, passed away in October, having been stricken with fatal illness very soon after his election on the first Monday in September. After waiting a reasonable time and hearing nothing of the election or appointment of any one to fill the vacancy, I addressed a circular-letter to the physicians of the county and a similar notice to the non-professional members of the County Board, notifying them to attend a meeting for the election of a successor to Dr. Smith.

On the 6th of December I received a very courteous letter from Mr. J. H. Blount, of Hertford, the able Solicitor of the First District, stating that at the meeting called as above Dr. J. W. Speight was elected. That the Board of County Commissioners had previously elected Dr. McMullan. That a majority of those eligible to membership in the County Board was not present at this meeting nor at that which elected Dr. Smith in the first instance. That he wished to settle the contest between the two gentlemen named. He presented these three questions: "1. If a Superintendent is elected and there is a vacancy what provision or authority is there to fill the vacancy? 2. What provision or authority is there to call a meeting of County Boards of Health on any other day than that designated by the act? 3. What power or authority has less than a majority of the County Board of Health to elect a Superintendent?" and asked that the Attorney General be requested to pass upon them.

The following is an abstract of my reply: No provision for filling vacancies was made in the law. In the absence of special instructions common sense would suggest that the same power which originally filled the office should fill any vacancy occurring in it. According to my information Dr. J. T. Smith had been properly and regularly elected according to law Superintendent of Health of Perquimans county on the first Monday in September. In obedience to the duty laid upon me as Secretary of the State Board of Health, in section 8 of the law, I had notified all persons eligible to membership in the County Board of Health of the meeting to be held on the first Monday in September. It having been made my duty in that case and not made the duty of any one else in the other, it was reasonable to suppose that it was my duty to arrange for the second meeting. In answer to his third question I stated that I could not give an opinion other than that it had been customary for the County Boards to act regardless of the number present and no point had ever been raised except in one instance. Upon the return to the city of the Attorney General I submitted to him the letters from Mr. Blount, Mr. Speight, the Register of Deeds, Dr. J. W. Speight, the newly elected Superintendent, and my reply to the first named, and asked his opinion. He gave it as follows:

RALEIGH, N. C., December 18, 1893.

Dr. R. H. Lewis, Secretary of the State Board of Health:

After carefully reading the letter of Mr. J. H. Blount to you of December 6, 1893, concerning the election of a County Superintendent of Health for Perquimans county, I find that it is necessary for a proper decision upon the subject to answer only the third question therein propounded. That question is, What power or authority has less than a majority of the County Board of Health to elect a Superintendent? Less than a majority of the County Board of Health has no power or authority to elect a Superintendent. Without giving my reason for this conclusion more elaborately, I refer you to the case of the Cleveland Cotton Mills *vs.* The Commissioners of Cleveland County, 108 N. C. Reports, page 678, which to my mind is conclusive of the question. If I am right, the office of Superintendent above referred to was never filled by the Board of Health, as there was no legal meeting at the time authorized by law, as a majority did not meet. If there was no lawful meeting there was no legal election. When the County Board fails to meet, as authorized by law, the Board of Commissioners must elect a Superintendent. A majority of the Board of Health of Perquimans county did not meet, so the letter states, and did not elect Dr. J. T. Smith to the office of Superintendent, therefore that office has never been legally filled. It is vacant now and must be filled in accordance with section 5, chapter 214, Laws of 1893. The County Commissioners must therefore, if they have not already done so, elect the Superintendent.

With reference to the other questions in the letter, permit me to say that I will answer them at any time they may become practical, or whenever you deem it necessary for me to do so.

Yours respectfully,

F. I. OSBORNE,
Attorney General.

In accordance with this opinion the County Commissioners elected Dr. J. W. Speight, the present incumbent, the same gentleman that had been chosen by the County Board of Health.

In view of this decision of the Attorney General it is of great importance that the physicians of the State should not forget when the time for the next meeting to elect a Superintendent arrives on the first Monday in September, 1895, that a majority must be present to make a legal quorum.

WATER AND WATER SUPPLIES.

During the year a number of analyses of water under permit of the Board have been kindly made for us by the State Experiment Station, Dr. H. B. Battle, Director. Without mentioning those devoid of special interest I will call attention to those of the two extremes. A sample from the deep well system recently put in at the State Hospital at Morganton showed a water of singular purity. In the words of the chemist, "it is refreshing to see such an analysis." On the other hand, samples last fall from the Little river water supply of Goldsboro showed an alarming amount of albuminoid ammonia. As a result of the correspondence which ensued between Mr. T. H. Bain, Clerk of the City Board of Health, and myself the State Board was requested to send a committee to investigate the water supply. In compliance with this request President Bahnson designated Dr. Geo. G. Thomas and myself. After an inspection of the works and water-shed for a mile and a half above the intake, various inquiries and consultation, we prepared and transmitted a full report, as follows:

Raleigh, N. C., May 3, 1894.

T. H. Bain, Esq., Secretary City Board of Health, Goldsboro, N. C.,

Dear Sir:—The undersigned, constituting the Committee of the State Board of Health appointed by its President at the request of your Board to inspect the public water supply of your city and make recommendations or suggestions in regard to the same, beg leave to report through you as follows:

An inspection of the water-shed of Little river, extending not more than a mile and a half above the pumping station, revealed several sources of contamination:

1. A large ditch draining the land west of that portion of the town near the depot of the North Carolina Railroad, the rice mill, and all the land between these localities and the river. On the slope midway between the rice mill and the river we noted a number of small houses occupied by negroes. The yards were dirty, there were hog-pens on several, and as no privies were in evidence we assume that the human excrement, in common with all other kinds of filth, is deposited upon the surface of the ground to be washed by the first rain into the ditch towards which all these lots slope.

2. About three hundred yards north and east of the point at which the ditch crosses the county road going towards Hook's bridge another stream runs across the road and empties into the river an eighth of a mile above the pumping station. This stream rises in or near a small hamlet called "Greenleaf" and drains all the open land between this settlement and the river. The man in charge of the station informed us that during heavy rains this stream was laden with filthy matter.

3. One mile and a half above the pump-house there empties into the river a moderately large branch which supplies water for a whiskey distillery and flows through the large hog-pen attached to the establishment. About one hundred hogs are penned and fed, on both sides of this stream and in large open boxes over it, upon the refuse of the distillery. Their

droppings mixed with this fermenting matter are washed into the stream and down into the river. The distillery is from a half to three quarters of a mile from the river and this space is a range for hogs.

4. A small settlement of negroes on Mr. Howell's plantation beyond the river, the drainage from the same being into that stream.

5. A grave-yard, still in use, about twenty feet from the river bank.

6. The arable land adjacent, the principal fertilizing material used being composted manure.

Analyses of the Water.—The three samples taken from the river in November, when there was a slight freshet, at the mouth of the intake and from two points in the course of the mains and numbered "1," "2" and "3," show respectively: free ammonia .152, albuminoid ammonia .30 parts per million; free ammonia .048, albuminoid ammonia .254, and free ammonia .066 and albuminoid ammonia .256.

Of the four samples sent to the Experiment Station in March "No. 1, taken from the river about one and one-half miles from pumping station," shows: chlorine 19.10 grains per gallon, free ammonia 0.592 parts per million, albuminoid ammonia 0.578; "No. 2, an inlet about one mile from pumping station," shows: chlorine 5.40, free ammonia .150, albuminoid ammonia .188; "No. 3, fifty feet from pumping station," shows: chlorine 0.58, free ammonia .064, albuminoid ammonia .106; "No. 4, from intake at pumping station," shows: chlorine 1.00, free ammonia .080, albuminoid ammonia .116.

Mr. Wanklyn, one of the highest authorities on water analysis, lays down the following rules: "If a water yield .00 parts of albuminoid ammonia per million it may be passed as organically pure, despite of much free ammonia and chlorides; and if, indeed, the albuminoid ammonia amounts to .02 or to less than .05 parts per million the water belongs to the class of very pure water. When the albuminoid ammonia amounts to .05 then the proportion of free ammonia becomes an element in the calculation; and I should be inclined to regard with some suspicion a water yielding a considerable quantity of free ammonia along with .05 parts of albuminoid ammonia per million. Free ammonia, however, being absent or very small, a water should not be condemned unless the albuminoid ammonia reaches something like .10 per million. Albuminoid ammonia above .10 per million begins to be a very suspicious sign; and over .15 ought to condemn a water absolutely." In making a practical application of these rules it should be borne in mind, as Wilson in his Hand-book of Hygiene, from which the above is taken says, that surface waters in country districts may have more than .15 albuminoid ammonia and yet be comparatively innocuous for the reason that it may be of vegetable instead of animal origin, and especially is this apt to be the case if the amount of chlorine is exceedingly small.

Having now before us the facts to be judged and the rule by which to judge them, we draw the following conclusions:

1. If the three samples analyzed in November, 1893, are fairly representative of the water it should in our opinion be condemned for drinking purposes. Although from the small amount of chlorine yielded by those samples it is more than probable that the chief source of the albuminoid ammonia was vegetable matter the amount is entirely too large, no matter what its origin.

2. Of the samples drawn in March, No. 3, taken fifty feet from pumping station, and No. 4, from intake, represent indifferent to fair drinking water chemically considered. No. 2, from a small stream running along by the county road and emptying into the river, is bad, while No. 1, from the river near the mouth of the stream running through the large hog-pen of the distillery, is extremely bad—simply villainous. This hog-pen is manifestly the chief source of impurity.

3. We desire to call particular attention to the fact that chemically impure water while bad is not the worst—that water which, according to the chemical analysis, is good, potable water may yet be deadly if contaminated by the specific germs of disease, although still worse if both chemically and biologically impure. To make a practical application of what we mean we will say by way of illustration that if a case of typhoid fever should occur in one of the houses on the ditch between the rice mill and the river and if the undisinfected dejections of the patient should be thrown into the ditch or on the surface of the ground sloping towards it, the danger to the persons drinking the river water would be much greater than the hog-pen alone could make it.

RECOMMENDATIONS.

1. That if your Board does not already possess it you make it a point to obtain from the next General Assembly a special act giving you full control of the water-shed of Little river in its relations to the purity of the water of that stream.

2. That the stream known as "Jumping Run" be drained into the large ditch which now empties immediately above the pumping station, and that a canal be dug behind the station so as to convey all the water from "Jumping Run" and the ditch nearer the town, which receive the washings of the negro settlement alluded to, into the river at a point not less than one hundred (100) feet below the point of intake.

3. That you make it your business to see that section 21 of Chapter 214, Laws of 1893, which bears on this subject, is rigidly enforced.

4. That immediate steps be taken to abate the very offensive nuisance of the hog-pen as now located at the distillery.

5. That all persons living on the water-shed who come within your jurisdiction be required to construct privies and use in the same the tub and dry earth system.

6. That the water company be urged to purify the water as much as possible. A properly constructed and properly cared for sand and gravel filter would probably afford the best means of accomplishing it as things now stand. But there is a more excellent way, and that would be to abandon the river altogether and obtain the water for the town from deep wells bored through the stratum of impervious marl or clay which underlies your section. We were told that such a well furnishing excellent water had at one time existed in your city. The very best filters are not always reliable, and they are very expensive to make properly. Inferior filters are positively worse than nothing, actually increasing the danger. Granting that you had dictatorial powers and the greatest abundance of money, it would be practically impossible for you to effectually guard from contamination such an area as is drained by Little river. Granting that the water company would construct the very best filters and operate them in the very best manner, you could never feel entirely safe during the prevalence of cholera or typhoid fever (a very common disease, killing, it is estimated, more than a thousand of our people every year) up the river. Water from the deep wells referred to could not be contaminated. It would possess the confidence of your citizens. It would in all probability be clear and attractive in appearance. The imagination could not conjure up any horrible possibilities as to what it might contain. The people would drink it in preference to your best well water, if wise. If such a water supply could be obtained we believe that the best thing Goldsboro could do for the health of its citizens would be to fill up every surface well in the city and thereby compel its exclusive use. We further believe that the increased consumption would more than re-imburse the water company for the outlay necessary to obtain it.

We beg to say for ourselves, and we believe the opinion would be endorsed by our full Board, that we earnestly deprecate the use in malarial regions of surface water, for the reason that aside from the difficulty of preserving it from contamination there is good ground for the belief that it holds and takes with it into the system the malarial poison. The Board of Health has begun the investigation of this subject and it hopes in the near future to present to the public the evidence of our own people as to its truth.

In conclusion, we wish to express our appreciation of the courteous assistance afforded us by yourself, Mayor Broadhurst and other members of your Board. Very respectfully,

GEORGE GILLETT THOMAS, M. D.,
RICH'D H. LEWIS, M. D.,
Committee.

SMALL-POX.

Considering the prevalence of this disease in so many localities all over the country, and particularly considering, in view of the first named fact, the defenseless condition of our people from want of vaccination, we have been extremely fortunate so far. Only two cases have occurred in our State. One was a refugee from Chattanooga to Cherokee county in December, 1893, and the other a case of varioloid in Wadesboro in the person of a horse drover from Southwest Virginia. The former, rather than submit to the quarantine which Superintendent of Health Abernathy promptly proposed to apply, fled the county and the State, thereby demonstrating in a most satisfactory manner the value of an active, alert health officer. The second case, which was a very mild one, was isolated and all persons exposed as well as numbers of others vaccinated. In this way, by scaring a number of the unvaccinated into that most important step, he served an excellent purpose.

This subject of vaccination, *i. e.*, the practical question of how to get the people vaccinated, remains one of the most important and at the same time the most difficult to which we are called to address ourselves. Attention was called to the prevalence of small-pox in the country and the importance of vaccination in the December Bulletin and again more at length in that for January. Inasmuch as your Secretary's views were fully set forth in the latter article it is unnecessary to take up your time with recounting them beyond repeating that in his opinion nothing but the actual appearance of small-pox in a community would accomplish anything worth mentioning. At the time of the Wadesboro case I ordered one hundred vaccine points in the hope that there might be a demand for them. *Thirty* have been disposed of to date.

VITAL STATISTICS.

While we have made distinct progress in the past year in this branch of our work we are still very far from where we ought to be. It is of course manifestly impossible to obtain accurate statistics from the country districts, and so our efforts have been directed to the towns and cities. We have now twenty-nine towns reporting, as against twenty-five a year ago, Morehead City having discontinued its reports and Lenoir, Pittsboro, Warrenton, Washington and Winston having been added to the list. The total population represented is 144,934, of whom 85,750 are white and 59,204 are colored. The annual death-rate for the former is 12.4 and for the latter 21.7 per thousand. The deaths from consumption were among the whites 115 or 1.33 per thousand, while among the negroes they were 184 or 3.11 per thousand. These figures, while we cannot say they are absolutely reliable in every instance, are so in the main and are both interesting and instructive as showing the difference in mortality in the two races, particularly the great increase of consumption in the colored people, among whom it was in the days of slavery almost an unknown quantity, and as illustrating in a striking manner the effects of comparatively sanitary and very unsanitary conditions.

This question of reliable mortuary statistics is an unusually important one to a State which, like ours, is seeking to attract immigrants of intelligence and character. The health argument is one of our very strongest, but it will have very little weight with the class we have in view unless we can support that argument with facts that cannot be controverted. We have the facts; let us collect them in such a way as to put them above suspicion. To assure reliable statistics from our principal towns and cities a little personal interest on the part of our physicians living within their gates is all that is necessary. We earnestly hope they will help us in this respect.

THE BULLETIN.

Being thoroughly convinced that the cause of preventive medicine in the State could make no substantial progress without at least the moral support if not the positive aid of the members of the profession, your Secretary has used the monthly publication of the Board as a means of communication with them. Acting under the belief that a member of the Medical Society of the State was *ipso facto* more or less alert and interested in his profession, and wishing to reach that class particularly, the edition of the Bulletin was with the December number increased from about 800 to nearly 1,200 copies and the name of every member of the Society was put upon the mailing list. As you are already aware an effort has been recently made to obtain a reasonable number of subscribers at twenty-five cents per annum in order to allow of its being mailed as second class matter at an annual saving in postage of more than a hundred and forty dollars. But I regret to say that the effort has met with very indifferent success, the total number of subscribers enrolled to date being fifty-three. The effort will, however, be continued until the requisite number is obtained. When that is accomplished it would probably be wise to still further extend its distribution.

MALARIA AND DRINKING WATER.

Believing that the malarial poison is in many if not most instances introduced into the system through the drinking of surface water from shallow wells in the considerable portion of our State in which this class of diseases prevails, a movement was inaugurated in the last Bulletin to bring about, if possible, a reform in the matter. To that end a circular-letter asking for information upon this subject from those who have had experience with this source of water supply has been sent to every physician in the localities referred to, and to every newspaper with the request to publish. A number of replies have already been received, and it is hoped that a mass of evidence of such a character as to impress the minds of the people interested may be secured for subsequent distribution.

LEGISLATION.

Although the new health law enacted by the Legislature of 1893 was a great improvement in many respects on the Act of 1885, in two particulars it was distinctly worse, viz.: in taking the appointment of a majority of the State Board of Health from the State Medical Society and giving it to the Governor and by reducing the term of office of those elected by the Society from six to two years, the term of the Governor's appointees, instead of raising the latter to six. Some provision should also be made for filling vacancies in the office of Superintendent of Health and certain other minor amendments would be desirable. It is hoped that the Committee on Legislation will bear these matters in mind.

As sight is next to life, and as blindness from ophthalmia neonatorum is largely preventable, it is plainly our duty as guardians of the public health to exert our best efforts to prevent it. It is estimated that there were 5,000 blind from this cause in the United States in 1890, which would mean about 100 for our own State. This sad record should be amended in the coming years. As a step in that direction, and as setting forth the opinion of the leading medical men of the State, I would respectfully suggest the adoption by this meeting of the following preamble and resolutions, the same being a modification of those adopted by the Section of Opthalmology of the American Medical Association in 1893:

WHEREAS, There are in our State fully one hundred persons hopelessly blind because of inflammation of the eyes occurring immediately after birth; and

WHEREAS, This unfortunate result is largely preventable, being due to the neglect of nurses and midwives; therefore be it

Resolved, That it is the sense of this Conjoint Session of the State Board of Health and the State Medical Society that legislation tending to lessen blindness from this disease similar to that already enacted in a number of the other States is desirable.

Resolved, That the Committee on Legislation of the Medical Society be requested to use their best endeavors, if in their judgment, after the assembling of the Legislature in 1895 it be wise to agitate the subject, to secure the enactment of such a law.

EDUCATION IN HYGIENE.

All our principal health officers are physicians and every physician is, or ought to be, a health officer. It is therefore important that they should be well educated in hygiene. Our Medical Practice Law requires that they shall be, for "Medical Hygiene" is, in the enumeration of the various branches on which it is made the duty of the Board of Medical Examiners to examine applicants for license, made of equal dignity with all other branches. There is reason to believe that most if not all our medical colleges do not devote the time or attention to this subject that its importance demands. I would therefore respectfully suggest for your consideration and adoption this resolution:

Resolved, That the medical colleges of the country be requested to give to the subject of hygiene sufficient time for thorough instruction of their students on that subject not less than two lectures a week.

Resolved further. That our Board of Medical Examiners are hereby requested to require of applicants for license the same preparation on this as on the other branches of medicine named in the Medical Practice Act.

MARITIME QUARANTINE.

It is with great regret that I report the failure so far on the part of the City of Wilmington to avail itself of the opportunity to secure a first-class quarantine station, with all the modern improvements, at Southport. It will be remembered that as the result of the well-planned, earnest efforts of Drs. Thomas, Burbank and others the last Legislature appropriated $20,000 for that purpose upon condition that the City of Wilmington supplement it with $5,000. This condition the Board of Aldermen at its last meeting refused to comply with, proposing instead to ask the United States authorities to take charge. Whether they will do so or not remains to be seen, but in any event it is a great disappointment not to have our own station.

MEETINGS OF HEALTH ASSOCIATIONS.

In obedience to instructions from the President of the Board I attended the Pan-American Medical Congress at its first session in the city of Washington in September last. Being present as a delegate from our State Board of Health, I attended almost exclusively the session on Hygiene, Climatology and Demography.

In October in company with Mr. J. C. Chase I attended the International Congress of Public Health, which met with the American Public Health Association in the city of Chicago. While the number of delegates from abroad was very limited the meeting was both interesting and instructive. At both of these gatherings your Secretary obtained new ideas and had his sanitary zeal quickened.

In conclusion, I am proud to say that in looking back over the past year it is clear that the cause of preventive medicine in North Carolina has gained ground. In addition to the particular things that have been accomplished as set forth in the body of this report, the interest in the cause on the part of both the profession and the people is greater than it was. I feel that we have a right to "thank God and take courage" in the hope of making still greater progress the coming year.

DISCUSSION.

Dr. Hill asked if the water at Goldsboro might not have been made impure by the decomposition of the vegetable matter in the river.

Dr. Lewis stated that that was the opinion of the Secretary until after the analysis of the river water.

The question was asked if persons drank that water continually would it not show itself in some disease. Dr. Lewis said that a person may drink very filthy water according to the chemical analysis and not be perceptibly hurt, while he may drink a chemically pure water that is contaminated with disease germs and be made sick. It does not follow because persons are not made sick that the water is not impure. The filthiness of the water only affords better opportunity for the development of the germs.

The authorities should receive full power from the Legislature to have charge over the water-shed. The law is of a most rigid character. A man is severely punished for throwing matter which has not been disinfected upon the water-shed.

Dr. Faison said that the water of Charlotte was decidedly foul and full of germs and he wanted to know if there was any arrangement or any money by which the Board might help the city.

Dr. Kinyoun was asked for his advice upon the subject.

Dr. Kinyoun—To explain all the qualities of drinking water, even from the bacteriological point of view, would mean many hours, for there are a great many favorable opinions and a great many adverse opinions to be given. In answering the query I would say, in regard to bacteriological examinations, the general policy of the Marine Hospital Service, in so far as it could never examine all the kinds of water that would be submitted to it, if it would signify its willingness to do so, is to bring before the authorities of the State the necessity for these examinations, and to encourage home sanitation, which is the sanitation to be desired. The hospital service is now open for instruction of representatives from State and municipal authorities, for the purpose of giving them the necessary information for making these examinations. A complete laboratory for making the experiments is not necessary. It is earnestly desired that the States will give it their official recognition and send representatives. All materials will be furnished *gratis*.

In regard to the character of the water, if the signs of the sewerage of the city should continue to be found in the water, I should unhesitatingly condemn it as suspicious. It is especially so of well water. If you have an examination made of a well, and the analysis proves to be fair or good, it does not follow that within six weeks the water may not become contaminated. The examinations should be made often enough to establish the purity of the water. The apparatus for examining the water is sò simple and so inexpensive—the most expense is the microscope and it can be gotten for $75—that the county with a hundred and fifty dollars can purchase sufficient apparatus for the examinations.

The course in Washington is six weeks in duration.

The question was asked that if to a certain sample of water one drop of permanganate of potash be added and the water set aside for an hour or two and still retain the peculiar color would he consider that water drinkable. Or, if he made a solution of nitrate of silver. and if after an hour there was the slightest milky appearance and no deposit, would he not consider the water contaminated with organic matter.

Dr. Kinyoun—No, I do not. Very frequently the permanganate is clarified by the acid in the water. Unless it has a large amount of organic matter present the test is not worth mentioning in establishing the purity of the water.

Dr. Powers said that he understood from what had been said that anything that is not destructive to bacteria might become favorable to its development. Even if the water is chemically pure they will be present in it in an active state, and when taken into the body, if conditions are favorable, germination will take place. On the other hand, if the water contains a trace of organic matter, and nearly all pure waters do, the germination begins to take place in the water. According to the amount of organic matter in the water depends the strength of the bacteria. We can see in this way how in one year we have a very mild form of a disease and the next year have a very severe form.

The resolutions recommended by the Secretary were unanimously adopted.

Dr. Lewis said, in regard to the prevention of blindness, an objection had been raised that it is impossible to have a law such as this carried out. The law simply requires that the attendant on the appearance of redness of the eyes immediately after birth shall report it to the physician. The main idea is that people have a tendency to follow the law just because it is the law.

The Secretary thanked the County Superintendents for their presence and for the prompt reports they had handed in.

On the motion of Dr. C. J. O'Hagan a vote of thanks was tendered the Secretary.

On motion the Conjoint Session adjourned.

RICH'D H. LEWIS, M. D.,

Secretary.

VITAL STATISTICS.

The collection of full and accurate vital statistics, including births, deaths and marriages, is in the present stage of our sanitary development impossible. Indeed it is impracticable to obtain even mortuary statistics for the whole State, our population being largely rural. So we have confined our efforts to such cities and towns as could be induced to make reports. They have been encouragingly rewarded. The number of cities and towns reporting at the end of 1892 was twenty, representing a total population of 116,799—74,150 white and 42,649 colored, while at the end of 1894 the number of cities and towns was thirty-one, containing 87,350 whites and 61,004 negroes, or a total population of 148,354. Of these thirty-one cities and towns twenty-eight sent in reports for every month in the two years, and our remarks on the death-rate will be based on them.

For the State as a whole, inasmuch as it is in general characteristics divided into three distinct sections, we have thought it best to substitute for the large, unwieldy table showing the diseases prevailing in the State by counties a table (No. I) showing the comparative prevalence of certain of the more important diseases usually reported by the County Superintendents of Health in the three physical divisions of the State. As it is intended to be comparative it is expressed in per cent. so that it may be comprehended more easily. On the whole, with the exception of malarial affections, which are much more prevalent in the Eastern Division or flat country, rapidly diminishing as the elevation increases, the diseases selected for tabulation are quite evenly scattered over the whole State. While not so pronounced by any means the reverse of the above is true in regard to typhoid fever, which increases with the elevation, the percentage of counties in the east reporting it in 1893 being 33.1, in the center 37.5 and in the west 45.1, and in 1894 35.5, 42.5 and 43.5 respectively. The influence of specifically contaminated drinking water in the production of typhoid fever has long been well known, but the introduction of the malarial poison into the system through the medium of the drinking water is a comparatively new theory. For facts bearing on this subject the reader is referred to an article on "Drinking Water in its Relation to Malarial Diseases" in the Appendix. It is hoped that by its distribution throughout the malarial section the prevalence of that form of disease will be greatly diminished.

The mortuary statistics gathered from the cities and towns referred to above, we regret to admit, are not reliable in many instances. A large number of deaths, we feel constrained by the very low death-rate to believe, are not recorded in some of the towns. It is extremely difficult to secure the adoption and enforcement by the municipalities of the proper methods for securing fullness and accuracy although we are gradually advancing in this as in other respects. On account of their poverty and obscurity as a class it is more than probable that more deaths among the negroes were not recorded than among the whites, so that we feel confident that the death-rate given for the colored is relatively too low, as bad as it already is.

In 1893 the death-rate calculated from all the cities and towns reporting, total population, whites 62,900, colored 46,704, was respectively 13.18 and 20.25. In 1894 in the twenty-eight cities and towns making full reports, total population, whites 83,650, colored 59,604, it was 10.6 and 17.5. The difference in each year was practically the same, about seven per thousand greater in the colored race, which is presumptive evidence of the truth of the figures. The principal cause of death was consumption. The average death-rate from that disease for the past four years was, whites 1.17 per thousand, colored 3.28. For the purpose of obtaining more accurate *data* we have compiled the following from some of the largest cities whose reports are believed to be reliable:

1893.

Wilmington,	W. 1.66,	per M.	1 in 8.12	of all deaths,	C. 3.84,	1 in 6.06
Raleigh,	W. 1.85,	" "	1 " 8.84	" " "	C. 3.85,	1 " 5.63
Charlotte,	W. 1.33,	" "	1 " 10.16	" " "	C. 4.80,	1 " 5.25

1894.

Wilmington,	W. 1.33,	per M.	1 in 8.41	of all deaths,	C. 3.77,	1 in 6.28
Raleigh,	W. 1.87,	" "	1 " 8.40	" " "	C. 2.57,	1 " 8.38
Charlotte,	W. 2.00,	" "	1 " 6.83	" " "	C. 4.33,	1 " 5.19
Winston,	W. 1.15,	" "	1 " 8.66	" " "	C. 9.37,	1 " 2.95

The average for the three cities in 1893 was whites 1.61, colored 4.16 per thousand, and for the four cities in 1894, whites 1.59, colored 5.01.

This great disparity in the death-rate from consumption is attributable to a number of causes. They are, we think, insufficient clothing, the lack of fire in winter, the want of an abundance of good, nutritious food, the lack of proper care in sickness, the greater prevalence of syphilis among them, that disease being conducive to tuberculosis, and over-crowding in the most insalubrious parts of the cities and towns. It is to be noted that the figures given apply only to the cities and towns. The disease is doubtless less prevalent in the country, but even there it is much more common than formerly.

While no statistical tables of that time bearing on this subject are obtainable, the testimony of the older physicians and citizens generally is to the effect that in the days of slavery consumption was a rare disease among the negroes. The fact that when in servitude they were warmly clad and well shod, that they had plenty of fire, an abundance of simple but nutritious food, largely of an oily character, the best medical attention promptly supplied, that syphilis was very rare among them, that they were required to live a life of regular hours and that they were never crowded together in the towns, goes to confirm the reasonableness of the views expressed as to the causation of the present sad state of affairs.

In making these investigations it was considered very desirable to have a separate record for whites, blacks and mulattoes, for the purpose of ascertaining the exact facts as to the relative susceptibility of the pure-breds of both races compared with those of mixed race. But it was practically impossible to carry out such a plan with sufficient accuracy to make it worth anything. No question exists, however, in the minds of most medical men who have had opportunities for observation that the cross is full of physical evil. The leading colored practitioner of the State, who is a physician of ability and scientific attainments and of very large personal experience and observation among his own people, informed the writer that the mixed race was much more subject to consumption, scrofula and cancer than the pure blacks, and we can say the same for the whites.

The large death-rate among our colored people, with, we believe, a somewhat diminished birth-rate, though we have no statistics on the latter, is a serious matter looked at from the stand-point of both humanity and economics. We say economics because we feel sure that they could not be replaced by any class of laborers so well suited to our environment or so acceptable to the employers as a whole.

It is a generally accepted fact that the negro is not so susceptible to malarial diseases as the white race. Our experience is contrary to this opinion, the deaths from malarial fevers in the past two years being more than double among the former than the latter. To be exact, the death-rate from malarial diseases was in 1893, white 0.41, colored 1.17 per thousand; in 1894, white 0.29, colored 0.67. This is due, no doubt, to the fact that most of the colored people reside in the suburbs of the towns, which are always more malarious than the central or thickly settled portions, and to the relative lack of the necessary medicines and nursing, which is the common lot of the poor wherever found.

As is generally the case there are two sides to this question of the relative susceptibility to disease of the two races, and the other side is shown in the statistics of diphtheria. In the past two years twenty-two deaths among the whites were attributed to that disease, while not a single one among the colored was reported. These figures suggest the idea of the comparative immunity to diphtheria on the part of the negro, and the subject deserves and will receive further study.

Renewed efforts will be made to secure greater accuracy in the collection of mortuary statistics as well as the registration of births in our cities and towns, and we hope to make a much better showing in our next report.

TABLE I.—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1893 AND 1894.

(Eastern Division—Alluvial Plain. Central Division—Hilly. Western Division—Mountainous. The figures under the various diseases represent in per cent. the proportion of the counties mentioning the disease in question to the whole number of counties reporting for the month).

			Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia.	Scarlet Fever.	Typhoid Fever.
January,	E.	1893	36	17	5.9	0 0	17,6	17.6	5.9	0.0	41.2	11.8	17,6
		1894		29	3.4	3.4	72.4	6.9	6.9	3.4	41.4	6.9	17.2
	C.	1893	26	21	14.3	4.8	9.5	0.0	0.0	0.0	28.6	19.0	29.0
		1894		26	7.7	7.7	73.1	0.0	7.7	3.8	57.7	7.7	26.9
	W.	1893	34	18	11.1	0.0	16.7	0 0	0,0	0.0	27.8	5.5	38.9
		1894		34	20.6	0.0	85.2	0.0	0.0	0.0	38.2	5.9	20.6
February.	E.	1893	36	15	0.0	0 0	6.7	20.0	0.0	0.0	53.3	13.3	13.3
		1894		31	3.2	0.0	58.1	0.0	19.3	6.4	35.5	3.2	19.3
	C.	1893	26	19	10.5	0.0	10.5	0.0	0.0	0.0	36.8	15.1	5.3
		1894		26	3.8	3.8	46.1	0.0	0.0	0.0	53.8	7.7	11.5
	W.	1893	34	16	0.0	0.0	0.0	0.0	0.0	0.0	25.0	6.2	6.2
		1894		33	9.1	3.0	45.4	0.0	0.0	0.0	33.3	12.1	12.1
March.	E.	1893	36	18	11.1	0.0	16.1	5.5	0.0	0.0	38.9	11.1	11.1
		1894		30	33.3	33.3	23.3	10.0	10.0	33.3	23.3	16.7	20.0
	C.	1893	26	18	5.5	5.5	11.1	0.0	0.0	0.0	22.2	0.0	27.8
		1894		25	8.0	4.0	40.0	8.0	0.0	0.0	52.0	16.0	12-0
	W.	1893	34	16	6.2	0.0	25.0	6.2	0.0	0.0	25.0	6.2	6.2
		1894		33	6.1	3.0	9.1	0.0	0.0	0.0	12.1	3.0	3.0
April.	E.	1893	36	19	5.3	47.4	10.5	26.3	10.5	0.0	15.8	0.0	36.8
		1894		31	0.0	19 3	0.0	32.2	22.6	3.2	6.5	6.5	9.7
	C.	1893	26	19	0.0	0.0	16.0	0.0	0 0	0.0	31.6	5 3	10.5
		1894		24	0.0	41.7	0.0	4.2	0.0	0.0	12.5	12.5	16.7
	W.	1893	34	20	5.0	10.0	10.0	0.0	0.0	0.0	25.0	10.0	20.0
		1894		30	0.0	23.3	0.0	6.7	0.0	0.0	16.7	3.3	20.0
May.	E.	1893	36	20	10.0	60.0	0.0	40.0	5.0	5.0	10.0	10.0	25.0
		1894		30	6.7	46.7	0.0	36.7	3.3	0.0	0.0	6.7	46.7
	C.	1893	26	19	5.3	42.1	0.0	15.6	0.0	0.0	5.3	10.5	26.3
		1894		25	0.0	48.0	0.0	8.0	4.0	4.0	8.0	8.0	44.0
	W.	1893	34	19	0.0	36.3	5.3	0.0	0.0	0.0	10.5	0.0	21.0
		1894		32	3.1	31.2	3.1	0.0	0.0	3.1	3.1	6.2	46.9
June.	E.	1893	36	20	5.0	55.0	0.0	50.0	10.0	5.0	5.0	10.0	50.0
		1894		28	0.0	21.4	0.0	50.0	7.1	3.6	0.0	10.7	57.1
	C.	1893	26	22	4.5	40.9	0.0	22.7	0.0	0.0	4.5	4.5	27.3
		1894		25	4.0	40.0	4.0	24.0	4.0	4.0	4.0	4.0	60.0
	W.	1893	34	20	5.0	40 0	0.0	0.0	0.0	0.0	0.0	10.0	40.0
		1894		31	6.4	12.9	6.4	19.3	0.0	0.0	0.0	6.4	61.3

TABLE I.—Showing Comparative Prevalence, etc.—Continued.

			Whole Number Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia	Scarlet Fever.	Typhoid Fever.
July.	E.	1893	36	20	0.0	25.0	0.0	95.0	10.0	15.0	5.0	5.0	24.0
		1894		28	3.6	0.0	0.0	75.0	7.1	10.7	0.0	28.6	67.8
	C.	1893	26	21	23.8	14.3	0.0	28.6	4.8	0.0	0.0	9.5	33.3
		1894		27	0.0	3.7	0.0	40.7	0.0	7.4	0.0	11.1	74.1
	W.	1893	34	20	0.0	15.0	0.0	15.0	0.0	5.0	0.0	0.0	70.0
		1894		30	3.3	6.7	0.0	10.0	0.0	3.3	0.0	0.0	90.0
August.	E.	1893	36	19	5.3	5.3	0.0	68.4	5.3	10.5	0.0	10.5	63.1
		1894		30	3.3	6.7	3.3	83.3	16.7	13.3	3.3	10.0	60.0
	C.	1893	26	18	11.1	0.0	0 0	33.3	0.0	0.0	0.0	16.7	66.7
		1894		25	16.0	4.0	0.0	48.0	4.0	4.0	0.0	20.0	72.0
	W.	1893	34	22	18.2	9.1	0.0	4.5	0.0	0.0	0.9	4.5	95.4
		1894		29	31.0	0.0	0.0	13.8	0.0	3.4	3.4	13.8	86.2
September.	E.	1893	36	26	19.2	3.8	0.0	69.2	19.2	26.9	0.0	7.7	53.8
		1894		29	20.7	3.4	0.0	82.6	27.6	0.0	0.0	24.3	55.2
	C.	1893	26	21	23.8	9.5	4.8	42.8	0.0	9.5	0.0	19.0	66.7
		1894		25	36.0	8.0	0.0	60.0	8.0	0.0	0.0	24.0	56.0
	W.	1893	34	31	32.3	9.7	3.2	9.7	3.2	6.4	3.2	6.4	83.9
		1894		33	27.3	3.0	0.0	18.2	0.0	0.0	6.1	9.1	54.5
October.	E.	1893	36	29	10.3	6.9	0.0	62.1	41.4	27.6	0.0	6.9	37.9
		1894		30	13.3	0.0	6.7	70.0	40.0	23.3	3.3	26.7	36.7
	C.	1893	26	25	24.0	8.0	4.0	28.0	16.0	8.0	0.0	8.0	64.0
		1894		24	20.8	4.2	0.0	50.0	0.0	8.3	4.2	12.5	58.3
	W.	1893	34	31	39.0	3.2	0.0	16.1	3.2	0.0	0.0	16.1	79.4
		1894		31	22.6	0.0	6.4	16.1	6.4	3.2	6.4	16.1	58.0
November.	E.	1893	36	28	7 1	0.0	7.1	60 7	21.4	15.0	3.6	10.7	35.7
		1894		31	16.1	3.2	6.5	41.9	29.0	9.7	16 1	22.6	25.8
	C.	1893	26	26	15.4	3.8	19.2	19.2	11.5	0.0	19.2	19.2	65.4
		1894		26	7.7	0.0	3.8	23.1	3.8	0.0	11.5	19.2	42.3
	W.	1893	34	34	14.4	0.0	38.2	11.7	2 9	2.9	14.4	11.8	58.8
		1894		32	21.9	0.0	12.5	9.4	6.2	0.0	12.5	12.5	40.6
December.	E.	1893	36	28	3.6	0.0	57.2	10.7	10.7	3.6	17.8	14.3	28.6
		1894		29	13.8	0.0	3.8	27.6	20.7	0.0	27.6	31.0	10.3
	C.	1893	26	24	4.2	0.0	79.2	4.2	4.2	0.0	25.0	0.0	37.5
		1894		25	4.0	0.0	16.0	0.0	0.0	0.0	28.0	12.0	36.0
	W.	1893	34	33	12.1	0.0	90.9	0.0	0.0	0.0	36.4	0.0	21.6
		1894		28	17.9	0.0	0.0	0.0	0.0	0.0	28.6	3.6	28.6
Averages for the Year.	1893.	E.	36	21.6	6.9	16.9	9.6	43.8	11.6	9.0	15.9	9.3	33.1
		C.	26	21.1	11.9	10.7	12.9	16.2	3.0	1.5	14.4	10.6	37.5
		W.	34	23.3	11.9	10.3	15.8	5.2	0.8	1.2	13.9	6.4	45.1
	1894.	E.	36	29.7	9.7	11.4	14.5	43.0	17.5	8.9	13.1	16.2	35.5
		C.	26	25.2	9.0	13.8	15.2	22.2	2.6	2.6	17.6	12.9	42.5
		W.	34	31.3	14.1	6.9	14.0	7.8	1.0	1.1	13.4	7.7	43.5
	1893.	State.	96	66.0	10.2	12.6	12.8	21.7	5.1	3.9	14.7	8.8	38.6
	1894.	State.	96	86.2	10.9	10.7	14.6	24.3	7.0	4.2	14.7	12.3	40.5

TABLE II.—Showing the Comparative Prevalence of Disease During the Years 1893 and 1894.

(Of the 96 counties in the State the number sending reports each month is stated at the head of the columns.)

Diseases.		NUMBER OF COUNTIES REPORTING, BY MONTHS.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1893	56	50	52	58	58	62	61	59	78	85	88	85
	1894	89	90	88	85	87	84	85	84	87	85	89	82
Bronchitis	1893	6	1	2	2	--	--	--	--	--	2	6	4
	1894	13	18	14	9	5	1	1	2	3	5	9	5
Cholera (Chicken)	1893	1	--	4	1	3	--	2	1	--	2	2	1
	1894	2	1	3	--	2	6	4	6	2	2	1	--
Cholera (Hog)	1893	2	5	2	6	4	4	3	6	7	9	12	13
	1894	5	8	7	6	7	5	8	11	9	12	9	6
Diarrhœa	1893	--	--	--	--	13	24	14	2	2	--	--	--
	1894	--	--	--	13	35	21	10	4	2	2	--	--
Diphtheria	1893	--	2	4	2	3	3	5	7	20	21	11	6
	1894	10	5	5	1	3	3	2	14	24	16	14	10
Distemper (Horses)	1893	--	2	2	3	--	--	--	1	1	--	--	2
	1894	3	3	3	2	1	2	1	--	1	1	2	2
Dysentery	1893	1	--	1	4	--	28	11	3	6	5	1	--
	1894	3	2	3	23	35	20	3	3	4	1	1	--
Farcy (Horses)	1893	--	--	--	--	--	--	--	--	--	--	--	--
	1895	--	--	--	--	--	--	--	--	1	--	--	--
Influenza ("La Grippe")	1893	8	3	9	7	1	--	--	--	--	1	20	64
	1894	69	45	20	10	1	2	--	1	--	4	9	5
Malarial Fever	1893	3	3	2	5	11	15	23	20	29	30	26	4
	1984	1	--	3	14	13	28	35	41	46	38	22	8
Malarial Fever, hemorrhagic	1893	1	--	--	2	1	2	3	1	6	17	10	4
	1894	4	6	3	7	2	3	2	6	10	14	12	6
Malarial Fever, pernicious	1893	--	--	--	--	1	1	4	2	10	10	5	1
	1894	2	2	1	2	2	2	6	6	9	10	3	--
Measles	1893	2	6	7	7	4	1	1	1	1	-	2	2
	1894	4	4	4	3	8	4	2	2	1	3	5	2
Meningitis (Cerebro-spinal)	1893	--	--	--	--	--	--	1	--	--	--	--	--
	1894	--	--	--	1	--	--	--	--	--	--	--	--
Mumps	1893	2	1	3	2	3	--	--	--	--	--	--	2
	1894	2	3	3	--	1	2	2	1	--	1	2	--
Pneumonia	1893	18	19	15	14	5	2	1	--	1	--	11	23
	1894	40	36	24	10	3	1	--	2	2	4	12	23

TABLE II.—COMPARATIVE PREVALENCE OF DISEASE—*Continued.*

(Of the 96 counties in the State the number sending reports each month is stated at the head of the columns.)

DISEASES.		NUMBER OF COUNTIES REPORTING, BY MONTHS.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1893	56	50	52	58	58	62	61	59	78	85	88	85
	1894	89	90	88	85	87	84	85	84	87	85	89	82
Rabies	1893	--	--	1	1	2	--	--	--	1	2	--	--
	1894	1	2	1	2	--	--	--	--	--	--	--	--
Rötheln	1893	--	--	1	1	--	1	--	--	--	--	--	--
	1894	--	--	--	--	--	--	1	1	1	2	1	1
Scarlatina	1893	7	7	4	3	4	5	3	6	8	9	12	4
	1894	6	7	10	6	6	6	11	12	16	16	16	13
Small-pox	1893	--	--	--	--	--	--	--	--	--	--	--	1
	1894	1	--	--	--	--	--	--	--	--	--	--	--
Staggers (Horses)	1893	--	--	--	--	--	--	--	--	--	--	--	--
	1894	--	--	--	--	--	--	1	1	1	--	--	--
Tonsillitis	1893	...	3	2	2	1	--	--	--	--	--	--	2
	1894	--	1	1	2	--	--	1	1	5	2	2	1
Typhoid Fever	1893	16	2	8	13	14	24	30	46	54	51	47	24
	1894	19	13	13	13	40	50	66	67	55	43	32	20
Typho-malarial Fever	1893	--	--	--	--	--	1	1	1	2	5	5	--
	1894	--	--	--	--	1	1	1	2	2	1	1	1
Varicella	1893	--	1	2	1	--	--	--	--	--	--	1	...
	1894	--	3	1	1	2	2	1	--	1	1	3	2
Whooping-cough	1893	10	9	13	11	7	7	10	7	15	19	18	15
	1894	11	22	18	19	17	8	11	13	14	14	15	12

TABLE No. III.—Table of Mortality Reports from Towns for Year Ending December 31, 1893.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1893.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1893.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Asheville .... Dr. C. E. Hilliard........	W	7	8	14	5	6	13	5	8	10	10	10	11	107	163	11.2	12.8	22.4	8.0	9.6	20.8	8.0	12.8	15.0	15.0	15.0	16.5	13.5	13.6	8,000	12,000
Dr. H. L. Baird	C	2	7	5	6	3	2	9	3	5	2	3	9	56		8.0	28.0	20.0	24.0	12.0	8.0	36.0	12.0	15.0	6.0	9.0	27.0	14.0		4,000	
Charlotte	W	12	3	10	6	14	15	10	9	8	16	11	8	122	248	18.0	4.5	15.0	9 0	21.0	20.0	13.3	12.0	10.7	21.3	13.5	10.7	13.5	17.7	9,000	14,000
Fred. Nash, Esq............	C	13	12	8	12	8	14	11	11	7	11	8	11	126		26.0	24.0	16.0	24.0	16.0	33.6	26.4	26.4	16.8	24.4	19.2	26.4	25.2		5,000	
Durham .... Dr. N. M. Johnson........	W	4	6	3	4	4	3	4	3	1	4	5	2	43	70	10.7	16.0	8.0	10.7	10.7	8.0	10.7	8.0	2.7	10.7	13.3	5.3	9.5	8.7	4,500	8,000
Dr. J. M. Manning...	C	3	4	4	3	3	3	3	3	1	0	0	0	27		10.3	13.7	13.7	10.3	10.3	10.3	10.3	10.3	3.4	0.0	0.0	0.0	7.7		3,500	
Fayetteville................	W	0	1	8	1	1	4	4	5	5	3	1	5	38	80	0.0	4.3	34.3	4.3	4.3	17.1	17.2	21.4	21.4	12.8	4.3	21.4	13 6	16.0	2,800	5,000
Dr. J. H. Marsh............	C	1	0	2	3	2	4	4	4	7	3	7	5	42		5.4	0.0	10.9	16.4	10.9	21.8	21.8	21.8	38.2	16.3	38.2	27.3	19.1		2,200	
Goldsboro .. .. Mayor Hollowell	W	4	3	2	5	3	3	4	3	2	0	0	1	30	82	17.4	12.8	8 6	21.4	12.8	12.8	17.2	12.9	8.6	0.0	0.0	4.0	10.0	16.4	3,000	5,000
T. H. Bain, Esq............	C	2	8	3	4	6	6	7	6	5	1	2	2	52		10.9	43.6	16.4	21.8	32.7	32.7	38.2	32.7	22.2	5.4	12.0	12.0	26.0		2,000	
Greensboro..................	W	1	2	*a*	4	3	5	3	*a*	*a*	*a*	*a*	*a*	18	25 6 mos.	3.0	6.0	*a*	12.0	9.0	15.0	9.0	*a*	*a*	*a*	*a*	*a*	9.0	8.3	4,000	6,000
Dr. E. R. Michaux........	C	1	0		0	1	1	4						7		6.0	0.0		0.0	6.0	6.0	24.0						6.9		2,000	
Henderson	W	1	0	1	1	2	1	3	0	0	4	0	0	13	38	5.3	0.0	5.3	5.3	10.7	5.4	16.0	0.0	0.0	21.3	0.0	0.0	5.9	9.0	2,200	4,200
Dr. W. T. Cheatham.....	C	5	3	1	2	1	1	2	2	3	0	1	4	25		30.0	12.7	6.0	12.0	6.0	6.0	12.0	12.0	18.0	0.0	6.0	24.0	12.5		2,000	
Hillsboro	W	2	1	0	0	0	1	1	1	5	1	0	0	12	18	40.0	20.0	0.0	0.0	0.0	20.0	20.0	20.0	100.0	20.0	0.0	0.0	20.0	18.0	600	1,000
Dr. D. C. Parris............	C	1	0	0	2	0	1	0	0	0	1	0	1	6		30.0	0.0	0.0	60.0	0.0	30.0	0.0	0.0	0.0	30.0	0.0	30.0	15.0		400	
Lexington....................	W	1	1	0	0	0	1	0	2	0	0	*a*	0	5	7 11 mos.	8.0	8.0	0.0	0.0	0.0	8.0	0.0	13.3	0.0	0.0	*a*	0.0	3.0	3.1	1,800	2,100
Dr. R. L. Payne, Jr.......	C	1	0	0	1	0	0	0	0	0	0		0	2		40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	7.2		300	

TABLE No. III.—Table of Mortaity Reports, etc.—Continued.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1893.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1893.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Marion	W	3	1	0	0	0	1	0	1	0	0	2	1	9	15	55.0	18.4	0.0	0.0	0.0	18.4	0.0	15.9	0.0	0.0	36.9	18.5	13.8	18.7	650	800
Dr. B. A. Cheek	C	2	0	0	0	0	2	1	1	0	0	0	0	6		160.0	0.0	0.0	0.0	0.0	160.0	80.0	80.0	0.0	0.0	0.0	0.0	40.0		150	
Monroe	W	1	0	1	1	1	1	1	1	4	0	1	0	12	29	10.0	2.0	12.0	10.0	8.0	8.0	8.0	8.0	32.0	0.0	8.0	0.0	8.0	14.5	1,500	2,000
Dr. W. D. Pemberton	C	3	2	0	0	3	0	2	1	2	0	2	2	17		45.0	30.0	0.0	0.0	72.0	0.0	48.0	24.0	48.0	0.0	48.0	48.0	34.0		500	
Dr. J. M. Blair																															
Morehead City	W	0	2	2	1	1	6	3	*a*	*a*	*a*	*a*	*a*	15	20	0.0	22.0	18.5	9.1	8.9	52.0	26.0	*a*	*a*	*a*	*a*	*a*	18.6	21.2	1,385	1,620
Mayor T. C. Davis	C	0	0	0	1	1	2	1						5	7 mos.	0.0	0.0	0.0	51.1	51.1	102.1	51.1						36.5		235	
Oxford	W	3	3	1	0	0	3	2	3	3	2	1	0	21	56	21.2	21.2	7.0	0.0	0.0	21.2	14.1	21.2	21.2	14.1	7.0	0.0	12.3	16.7	1,700	3,300
Dr. Patrick Booth	C	4	1	6	2	1	5	7	1	1	3	2	2	35		30.0	7.5	45.0	15.0	7.5	37.5	52.5	7.5	7.5	22.5	15.0	15.0	21.2		1,600	
Raleigh	W	9	6	10	13	9	15	10	5	9	8	15	6	115	267	13.5	9.0	15.0	19.5	13.5	22.5	15.0	7.5	13.5	12.0	22.5	9.0	14.4	17.8	8,000	15,000
Dr. James McKee	C	10	6	12	12	13	18	17	15	12	16	12	9	152		17.1	10.3	20.6	20.6	22.3	30.8	29.1	25.7	20.6	27.3	20.6	15.2	21.7		7,000	
Rockingham	W	2	2	0	3	2	2	1	2	0	1	3	0	18	26	20.0	20.0	0.0	30.0	20.0	20.0	10.0	20.0	0.0	10.0	25.7	0.0	12.8	14.8	1,400	1,750
Dr. J. M. Stansill	C	1	1	2	0	0	1	2	0	0	1	0	0	8		24.0	24.0	48.0	0.0	0.0	24.0	48.0	0.0	0.0	24.0	0.0	0.0	22.8		350	
Rocky Mount	W	2	0	0	1	1	2	3	3	1	1	0	3	17	23	30.0	0.0	0.0	15.0	15.0	30.0	30.0	30.0	10.0	10.0	0.0	30.0	14.2	14.4	1,200	1,600
Dr. G. L. Wimberley	C	0	0	1	0	1	0	2	0	0	1	1	0	6		0.0	0.0	30.0	0.0	30.0	0.0	60.0	0.0	0.0	30.0	30.0	0.0	15.0		400	
Salem	W	6	1	6	1	1	5	13	5	2	0	7	2	49	60	18.3	3.0	18.2	3.0	3.0	15.1	39.5	15.2	6.1	0.0	21.3	6.1	12.4	14.0	3,942	4,284
Mayor J. R. Stockton	C	1	1	0	2	3	2	0	0	2	0	0	0	11		35.1	35.1	0.0	70.1	105.3	70.2	0.0	0.0	70.2	0.0	0.0	0.0	32.2		342	
Mayor T. B. Douthit																															
Salisbury	W	3	3	2	3	2	3	1	1	7	1	3	*a*	29	62	10.3	12.0	6.9	12.0	8.0	12.0	3.4	3.4	24.0	3.4	10.3	*a*	9.0	13.5	3,500	5,000
Dr. J. J. Summerell	C	4	2	4	3	1	0	1	5	5	3	5		33	11 mos.	24.0	12.0	32.0	18.0	6.0	0.0	8.0	40.0	40.0	24.0	40.0		24.0		1,500	
Scotland Neck	W	0	1	2	1	0	2	3	1	1	3	0	2	16	21	0.0	17.1	60.0	17.1	0.0	34.3	51.4	17.1	17.1	51.4	0.0	31.3	22.8	19.1	700	1,100
Mayor J. A. Perry	C	0	0	0	0	0	0	1	1	0	1	0	2	5		0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	30.0	0.0	60.0	12.5		400	

TABLE No. III.—Table of Mortality Reports, etc.—Continued.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1893.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1893.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Southport P. J. Farrell, Esq E. H. Cranmer, Jr., Esq.	W C	1 2	0 0	1 1	1 0	2 2	2 0	2 2	1 1	4 1	3 0	0 1	0 2	17 12	29	15.0 60.0	0.0 0.0	15.0 30.0	15.0 0.0	32.0 53.3	32.0 0.0	32.0 53.3	16.0 26.7	61.3 26.7	48.0 0.0	0.0 26.0	0.0 54.0	22.7 26.7	24.2	750 450	1,200
Statesville Dr. W. J. Hill	W C	0 0	*a*	1 0	1 0	5 0	1 0	2 1	0 0	2 2	*a*	0 0	2 0	14 3	17 10 mos.	0.0 0.0	*a*	4.8 0.0	4.8 0.0	24.0 0.0	4.8 0.0	9.6 12.0	0.0 0.0	9.6 24.0	*a*	0.0 0.0	9.6 0.0	6.7 3.6	5.5	2,500 1,000	3,500
Tarboro Dr. Donald Williams	W C	1 1	1 1	1 1	2 0	3 1	1 4	7 4	1 1	1 6	3 0	1 5	2 2	24 26	50	9.5 10.8	9.5 10.8	9.5 10.8	19.1 0.0	28.6 10.8	9.5 43.2	66.8 43.2	9.4 10.8	9.5 64.7	28.6 0.0	9.5 53.9	19.1 21.6	19.1 23.4	21.1	1,258 1,112	2,370
Warrenton Dr. P. J. Macon	W C	2 1	1 1	0 0	*a*	1 0	*a*	1 1	0 0	0 0	0 0	0 0	0 1	5 4	9 10 mos.	36.9 21.8	18.5 21.8	0.0 0.0	*a*	16.0 0.0	*a*	15.0 24.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 21.8	8.0 8.7	8.3	750 550	1,300
Washington Dr. W. A. Blount Dr. D. T. Tayloe	W C	*a*	*a*	*a*	*a*	*a*	2 5	6 2	5 9	*a*	2 2	3 2	4 3	22 23	45 6 mos.	*a*	*a*	*a*	*a*	*a*	9.6 30.0	28.8 24.0	24.0 54.0	*a*	9.6 12.0	14.4 9.6	16.0 18.0	14.7 23.0	18.0	3,000 2,000	5,000
Weldon Mayor J. T. Gooch	W C	0 1	0 0	0 0	1 1	2 1	0 3	1 6	1 2	1 4	1 1	0 3	0 0	7 22	29	0.0 17.1	0.0 0.0	0.0 0.0	16.0 16.0	34.3 15.0	0.0 45.0	17.1 90.0	17.1 30.0	17.1 60.0	17.1 15.0	0.0 45.0	0.0 0.0	10.0 27.5	19.3	700 800	1,500
Wilmington Dr. F. W. Potter Dr. R. D. Jewett	W C	4 18	7 21	8 22	13 13	9 34	12 21	14 29	12 36	11 29	10 32	11 28	11 20	122 303	425	4.8 18.0	8.4 21.0	10.7 22.0	15.6 13.0	10.8 34.0	14.4 21.0	16.8 29.0	14.4 36.0	14.7 26.8	13.3 31.1	14.7 25.8	14.7 18.5	13.5 23.3	19.3	9,000 13,000	22,000
Wilson Dr. A. Anderson	W C	4 1	0 2	2 3	1 2	3 4	2 1	4 3	2 2	4 2	2 2	3 2	3 2	30 26	56	24.0 8.0	0.0 16.0	12.0 24.0	6.0 16.0	18.0 32.0	12.0 8.0	24.0 24.0	12.0 16.0	24.0 16.0	10.0 16.	18.0 16.0	18.0 16.0	15.0 17.3	16.0	2,000 1,500	3,500

TABLE No. IV.—Table of Mortality Reports from Towns for Year Ending December 31, 1894.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1894.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1894.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Asheville	W	13	6	7	8	10	6	6	12	14	10	6	6	104	151*	19.5	9.0	10.5	12.0	15.0	9.0	9.0	18.0	29.0	15.0	9.0	9.0	13.0	12.6	8,000	12,000
Dr. H. L. Baird	C	3	4	7	8	7	7	4	1	1	2	0	3	47		9.0	12.0	21.0	24.0	21.0	21.0	12.0	3.0	3.0	6.0	0.0	9.0	11.7		4,000	
Charlotte	W	9	8	12	15	8	14	10	12	9	8	8	10	123	258	12.0	10.7	16.0	20.0	10.7	18.7	13.3	16.0	12.7	10.6	10.7	12.4	14.7	17.2	9,000	15,000
Fred Nash, Esq	C	16	1	16	11	9	20	12	12	13	9	8	8	135		38.4	2.4	38.4	22.0	21.6	48.0	28.8	28.8	24.0	18.0	16.0	16.0	22.6		6,000	
Durham	W	3	0	4	3	0	5	4	8	3	1	1	3	35	46	8.0	0.0	10.7	7.2	0.0	12.0	10.7	19.2	8.0	2.7	2.7	8.0	7.8	5.7	4,500	8,000
Dr. J. M. Manning	C	0	2	2	0	0	0	0	0	4	1	1	1	11		0.0	6.8	6.8	0.0	0.0	0.0	0.0	0.0	13.7	3.4	3.4	3.4	3.4		3,500	
Fayetteville	W	2	1	2	3	5	2	4	4	5	6	3	3	40	80	8.6	4.3	8.6	12.8	21.4	8.6	12.8	17.1	21.4	25.7	12.8	12.8	14.3	16.0	2,800	5,000
Dr. J. H. Marsh	C	4	3	1	1	1	5	6	5	3	8	3	0	40		21.8	16.4	5.4	5.4	5.4	27.3	27.3	27.3	16.4	43.6	16.4	0.0	18.2		2,200	
Goldsboro	W	5	1	2	1	3	3	3	7	2	6	4	0	37	62	20.0	3.4	6.8	4.0	10.3	10.3	10.3	28.0	8.0	24.0	16.0	0.0	11.7	12.4	3,000	5,000
T. H. Bain, Esq	C	0	1	0	1	2	2	3	3	3	6	2	2	25		0.0	8.0	0.0	6.0	16.0	16.0	24.0	18.0	18.0	36.0	12.0	16.0	12.5		2,000	
Greensboro	W	8	3	1	1	3	6	5	3	1	3	2	0	36	106	17.4	6.5	2.2	2.2	6.5	13.1	10.9	6.5	2.2	6.5	4.4	0.0	6.5	13.2	5,500	8,000
Dr. A. R. Wilson	C	10	7	5	5	8	2	9	9	5	6	2	2	70		48.0	33.6	24.0	24.0	38.4	8.0	43.2	43.2	24.0	28.8	9.6	9.6	28.0		2,500	
Henderson Dr. W. T. Cheatham	W	3	1	1	0	2	1	0	2	1	1	2	0	14	45	16.0	5.8	5.3	0.0	10.7	5.3	0.0	10.7	5.4	5.3	10.7	0.0	6.2	10.6	2,250	4,250
Dr. W. J. Judd	C	5	1	4	2	4	1	3	1	3	3	3	1	31		30.0	6.0	24.8	12.0	24.8	6.0	18.0	6.0	18.0	18.0	18.0	6.0	15.5		2,000	
Hillsboro Dr. D. C. Parris	W	1	0	1	0	1	0	0	0	1	0	0	0	4	13	20.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	10.0	18.6	400	700
Dr. C. D. Jones	C	2	3	0	0	1	0	0	0	0	1	1	1	9		60.0	90.0	0.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	40.0	40.0	30.0		300	
Jacksonville	W	*a*	*a*	*a*	*a*	*a*	*a*	*a*	0	1	1	0	0	2	3	*a*	*a*	*a*	*a*	*a*	*a*	*a*	0.0	30.0	30.0	0.0	0.0	12.0	12.0	400	600
Dr. E. L. Cox	C								0	0	0	1	0	1	5 mos.								0.0	0.0	0.0	60.0	0.0	12.0		200	
Lenoir	W	*a*	*a*	*a*	0	2	1	2	0	1	0	0	0	6	10	*a*	*a*	*a*	0.0	30.0	15.0	30.0	0.0	15.0	0.0	0.0	0.0	10.0	13.3	800	1,000
Dr. A. A. Kent	C				1	0	0	0	0	0	3	0	0	4	9 mos.				60.0	0.0	0.0	0.0	0.0	0.0	180.0	0.0	0.0	26.5		200	

*Of this total 26 deaths, from consumption, were of visitors.

TABLE No. IV.—Table of Mortality Reports, etc.—Continued.

Towns and Reporters.	Races.	Deaths by Months—1894.														Death-rate (annual) per 1,000 by Months—1894.														Population.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Lexington	W	1	1	1	0	1	2	0	0	2	3	0	0	11	11	6.7	6.7	6.7	0.0	6.7	13.3	0.0	0.0	13.3	20.0	0.0	0.0	6.1	5.2	1,800	2,100
Dr. R. L. Payne, Jr.	C	0	0	0	0	0	0	0	0	0	0	0	0	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		300	
Marion	W	0	1	0	0	0	1	0	1	0	1	0	0	4	8	0.0	18.5	0.0	0.0	0.0	18.5	0.0	18.5	0.0	18.4	0.0	0.0	6.1	10.0	650	800
Dr. B. A. Cheek	C	1	1	0	0	0	0	0	0	0	0	0	2	4		80.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	160.0	26.7		150	
Monroe	W	1	0	3	1	1	0	2	1	0	0	0	2	11	21	8.0	0.0	24.0	8.0	8.0	0.0	13.3	6.7	0.0	0.0	0.0	18.9	6.1	8.7	1,800	2,400
Dr. J. M. Blair	C	0	0	5	2	0	0	1	1	0	0	1	0	10		0.0	0.0	120.0	48.0	0.0	0.0	24.0	20.0	0.0	0.0	20.0	0.0	16.7		600	
Oxford Dr. Patrick Booth	W	0	2	2	2	2	2	1	3	2	1	1	1	19	37	0.0	14.1	14.1	14.1	14.1	14.1	7.0	24.0	16.0	80.0	8.0	8.0	12.7	13.2	1,500	2,800
Dr. W. O. Baskerville	C	1	0	1	2	3	3	1	3	0	1	2	1	18		7.5	0.0	7.5	15.0	22.5	22.5	7.5	27.7	0.0	9.2	18.5	9.2	13.8		1,300	
Pittsboro	W	1	1	1	0	0	0	0	0	0	1	1	0	5	7	34.3	34.3	34.3	0.0	0.0	0.0	0.0	0.0	0.0	34.3	34.3	0.0	14.3	11.7	350	600
Dr. L. A. Hanks	C	1	0	0	0	0	0	0	0	0	0	0	1	2		48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.0	8.0		250	
Raleigh	W	11	13	5	8	15	20	10	10	7	11	4	12	126	277	16.5	19.5	7.5	12.0	22.5	30.0	15.0	15.0	10.5	16.5	6.0	18.0	15.7	18.5	8,000	15,000
Dr. James McKee	C	17	14	6	11	18	15	14	12	15	12	11	6	151		29.1	21.0	10.3	18.8	30.8	25.7	24.0	20.6	25.7	20.6	18.8	10.0	21.6		7,000	
Rockingham	W	0	2	1	0	1	1	2	5	3	0	0	1	16	19	0.0	18.5	8.9	0.0	9.2	9.2	18.5	46.1	27.7	0.0	0.0	9.2	12.3	10.8	1,300	1,750
Dr. J. M. Covington	C	0	0	0	0	0	0	2	1	0	0	0	0	3		0.0	0.0	0.0	0.0	0.0	0.0	53.3	26.7	0.0	0.0	0.0	0.0	6.7		450	
Rocky Mount	W	1	0	0	1	1	1	3	2	1	0	0	1	11	17	10.0	0.0	0.0	10.0	10.0	10.0	30.0	20.0	10.0	0.0	0.0	10.0	9.2	10.6	1,200	1,600
Dr. G. L. Wimberley	C	2	0	0	2	0	1	0	1	0	0	0	0	6		60.0	0.0	0.0	60.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0	0.0	15.0		400	
Salem Mayor T. B. Douthit	W	3	0	1	0	6	3	1	4	1	5	6	6	36	41	9.1	0.0	3.3	0.0	18.3	9.1	3.0	12.2	3.0	17.7	18.3	18.3	9.1	10.5	3,942	4,284
F. E. Keehln, Esq	C	0	0	0	0	2	1	0	1	3	0	0	1	8		0.0	0.0	0.0	0.0	70.2	35.1	0.0	35.1	105.3	0.0	0.0	35.1	23.1		342	
Salisbury	W	0	1	3	1	3	3	4	0	1	1	3	7	27	55	0.0	3.4	10.3	3.4	10.3	10.3	13.7	0.0	3.4	3.1	10.3	24.0	7.7	11.0	3,500	5,000
Dr. John Whitehead	C	2	1	0	2	2	3	5	3	2	1	3	1	28		16.0	8.0	0.0	16.0	16.0	24.0	40.0	24.0	16.0	32.0	24.0	8.0	18.7		1,500	

TABLE No. IV.—TABLE OF MORTALITY REPORTS, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS—1894.														DEATH-RATE (ANNUAL) PER 1,000 BY MONTHS—1894.														POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	For the Year.	By Races.	Total.
Scotland Neck	W	0	0	1	1	2	2	0	0	1	2	0	0	9	24	0.0	0.0	17.1	17.1	34.3	34.3	0.0	0.0	17.1	34.3	0.0	0.0	12.8	21.8	700	1,100
Mayor J. A. Perry	C	1	1	3	0	0	3	0	0	3	2	0	2	15		30.0	30.0	90.0	0.0	0.0	90.0	0.0	0.0	90.0	60.0	0.0	60.0	37.5		400	
Southport	W	1	1	1	0	1	1	1	0	1	0	1	0	8	15	16.0	16.0	16.0	0.0	16.0	16.0	16.0	0.0	16.0	0.0	16.0	0.0	10.7	12.5	750	1,200
E. H. Cranmer, Jr., Esq L. A. Galloway, Esq	C	1	0	0	0	0	3	0	0	0	2	0	1	7		26.6	0.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	53.3	0.0	26.7	15.5		450	
Statesville	W	1	1	2	1	1	1	0	0	1	0	1	*a*	9	11 11 mos.	4.8	4.8	9.6	4.8	4.8	4.8	0.0	0.0	4.8	0.0	4.8	*a*	3.9	3.4	2,500	3,500
Dr. W. J. Hill	C	0	1	0	0	0	0	0	0	0	0	1		2		0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0		2.2		1,000	
Tarboro	W	2	2	1	1	2	0	0	2	3	1	2	0	16	34	19.1	19.1	9.6	8.5	19.1	0.0	0.0	19.1	28.6	9.5	19.1	0.0	12.7	14.3	1,258	2,370
Dr. Donald Williams	C	2	0	3	1	1	2	1	1	2	2	0	3	18		21.6	0.0	32.4	10.8	10.8	21.6	10.8	10.8	21.6	21.6	0.0	32.4	16.2		1,112	
Warrenton	W	0	1	0	0	0	1	1	0	0	1	1	1	6	7	0.0	16.0	0.0	0.0	0.0	16.0	16.0	0.0	0.0	16.0	15.0	15.0	8.0	5.4	750	1,300
Dr. P. J. Macon	C	0	0	0	0	0	0	0	0	0	0	1	0	1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	1.8		550	
Washington	W	3	4	2	2	5	3	1	3	4	3	3	2	35	100	12.0	16.0	8.0	8.0	24.0	14.4	4.8	14.4	16.0	12.0	12.0	8.0	11.7	20.0	3,000	5,000
Dr. D. T. Tayloe Dr. J. C. Rodman	C	6	4	7	7	1	3	1	4	5	15	4	8	65		36.0	24.0	42.0	42.0	4.8	11.4	4.8	19.2	24.0	90.0	24.0	38.4	32.5		2,000	
Weldon	W	2	1	0	2	2	0	1	0	1	2	1	1	13	30†	34.3	17.1	0.0	34.3	34.3	0.0	17.1	0.0	17.1	34.3	17.1	17.1	18.6	20.0	700	1,500
Mayor J. T. Gooch	C	1	2	3	1	3	0	1	1	2	0	2	1	17		15.0	30.1	45.0	15.0	45.0	0.0	15.0	15.0	15.0	0.0	30.0	15.0	21.2		800	
Wilmington	W	6	4	10	12	13	6	9	6	10	10	6	9	101	409	8.0	5.3	13.3	16.0	17.3	8.0	12.0	8.0	14.4	13.3	6.9	12.0	11.2	18.6	9,000	22,000
Dr. R. D. Jewett	C	26	31	25	20	28	25	32	24	31	27	17	22	308		24.8	28.6	23.1	18.5	25.8	23.1	29.5	22.1	28.6	24.9	15.7	20.3	22.9		13,000	
Wilson	W	1	0	1	3	1	3	2	5	4	4	1	2	27	53	6.0	0.0	6.0	18.0	6.0	18.0	12.0	30.0	24.0	24.0	6.0	12.0	13.5	15.1	2,000	3,500
Dr. Albert Anderson	C	1	1	1	0	3	2	5	2	3	3	1	4	26		8.0	8.0	8.0	0.0	24.0	16.0	40.0	16.0	24.0	24.0	8.0	32.0	17.3		1,500	
Winston	W	2	3	5	1	8	7	3	3	4	3	3	10	52	185	4.6	6.9	11.5	2.3	18.5	16.1	6.9	6.9	8.3	6.9	6.9	23.1	10.0	18.5	5,200	10,000
Dr. John Bynum	C	19	7	13	8	17	18	12	9	4	7	7	12	133		47.5	17.5	32.3	20.0	42.5	45.0	30.0	22.5	10.0	17.5	17.5	30.0	27.7		4,800	

†Of this total 5 deaths were of visitors, two of them accidents.

TABLE No. V.—Showing Causes of Death for the Year Ending December 31, 1893.

TOWNS.	RACES.	POPULATION.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Total Deaths.		Under 5 Years.		Still-born.		REMARKS.
		By Races.	Total.																By Races.	By Towns.	By Races.	By Towns.	By Races.	By Towns.	
Asheville	White...	8,000	12,000	3	0	0	3	0	0	16	23	9	13	4	10	21	1	1	107	163	29	55	10	20	
	Colored	4,000		0	0	0	0	0	0	7	11	2	6	1	7	20	2	0	56		26		10		
Charlotte	White...	9,000	14,000	12	0	0	1	1	0	11	12	6	16	3	21	36	2	1	122	218	40	72	9	22	
	Colored	5,000		5	0	3	0	0	0	14	21	6	12	5	12	39	5	1	126		32		13		
Durham	White...	4,500	8,000	2	1	2	2	0	4	6	5	0	2	2	4	12	1	0	43	70	16	20	3	3	
	Colored	3,500		0	0	0	0	1	2	2	7	0	1	0	5	8	1	0	27		4		0		
Fayetteville	White...	2,800	5,000	2	0	2	0	0	0	2	1	0	1	1	4	24	1	0	38	80	8	23	3	9	
	Colored	2,200		1	0	6	0	0	0	4	7	0	1	0	4	18	0	1	42		15		6		
Goldsboro	White...	3,000	5,000	1	0	0	1	0	0	4	3	0	3	1	5	12	0	0	30	82	11	27	2	8	
	Colored	2,000		0	0	4	0	0	0	5	11	2	3	0	8	18	1	0	52		16		6		
Henderson.	White...	2,200	4,200	0	0	0	0	0	0	0	1	0	2	0	1	9	0	0	13	38	2	10	0	0	
	Colored	2,000		0	0	0	0	0	0	4	7	1	0	1	4	8	0	0	25		8		0		
Hillsboro	White...	600	1,000	0	0	1	0	0	0	0	2	1	0	0	0	8	0	0	12	18	0	1	1	1	
	Colored	400		0	0	0	0	0	0	1	2	0	0	0	0	2	1	0	6		1		0		
Marion............	White...	650	800	0	0	0	0	0	0	3	2	0	0	4	0	0	0	0	9	15	0	0	1	1	
	Colored	150		1	0	0	0	0	0	0	2	0	0	0	3	0	0	0	6		0		0		
Monroe...........	White.	1,500	2,000	0	0	2	0	0	0	1	1	0	2	0	3	2	1	0	12	29	0	2	2	5	
	Colored	500		0	0	0	0	0	1	2	4	0	2	1	2	4	1	0	17		2		3		
Oxford	White...	1,700	3,300	3	0	0	0	0	0	2	0	2	2	2	3	7	0	0	21	56	10	21	3	6	
	Colored	1,600		2	0	0	0	4	0	2	3	0	1	2	2	18	1	0	35		14		3		
Raleigh	White...	8,000	15,000	6	0	2	1	1	0	11	13	5	10	0	7	54	0	2	115	267	39	102	12	25	
	Colored	7,000		2	0	5	0	2	0	5	27	7	7	1	15	78	3	0	152		63		13		
Rockingham....	White...	1,100	1,750	1	1	0	0	0	0	1	0	1	5	0	5	3	1	0	18	26	7	9	1	1	
	Colored	350		0	0	0	0	0	0	1	0	0	0	0	1	4	2	0	8		2		0		
Rocky Mount..	White...	1,200	1,600	6	0	0	0	0	0	1	3	1	0	0	4	2	0	0	17	23	0	1	0	0	
	Colored	400		2	0	0	0	0	0	2	0	0	1	0	1	0	0	0	6		1		0		
Salem	White...	3,942	4,284	2	0	0	0	0	0	5	2	3	6	2	7	22	0	0	49	60	17	20	0	0	
	Colored	342		1	0	0	0	0	0	1	2	0	0	0	3	4	0	0	11		3		0		
Scotland Neck..	White...	700	1,100	0	0	1	0	0	0	0	8	0	2	0	1	9	0	0	16	21	2	2	0	2	
	Colored	400		0	0	0	0	0	0	0	2	0	1	0	1	1	0	0	5		0		2		

TABLE No. V.—Showing Causes of Death, etc.—Continued.

TOWNS.	RACES.	POPULATION.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Total Deaths.		Under 5 Years.		Still-born.		REMARKS.
		By Races.	Total.																By Races.	By Towns.	By Races.	By Towns.	By Races.	By Towns.	
Southport	White	750	1,200	0	0	0	0	0	0	0	1	3	1	0	1	11	0	0	17	29	11	14	0	0	
	Colored	450		1	0	0	0	0	0	0	2	0	0	0	0	8	1	0	12		3		0		
Tarboro	White	1,258	2,370	7	0	0	0	0	0	3	2	2	2	0	4	4	0	0	24	50	6	20	0	0	
	Colored	1,112		3	0	2	0	0	0	3	3	1	2	0	6	6	0	0	26		14		0		
Weldon	White	700	1,500	0	1	2	0	0	0	0	0	0	0	0	1	3	0	0	7	29	3	11	3	5	
	Colored	800		0	0	2	0	0	0	0	1	0	0	0	3	14	2	0	22		8		2		
Wilmington	White	9,000	22,000	8	0	11	1	1	0	7	15	7	14	1	15	38	3	1	122	425	31	144	7	38	
	Colored	13,000		5	0	30	0	4	1	7	50	16	29	9	44	105	3	0	303		113		31		
Wilson	White	2,000	3,500	3	0	3	1	1	0	1	4	4	1	3	4	4	1	0	30	56	11	14	0	0	
	Colored	1,500		0	0	3	0	0	0	0	2	0	1	0	1	18	0	1	26		3		0		
Total, 20 towns	White	62,900	109,604	56	3	26	10	4	4	77	93	44	82	23	100	284	11	5	822	1785	244	571	57	146	
	Colored	46,704		23	0	55	0	11	4	60	167	35	67	20	122	373	23	3	963		327		89		
Grand Total		109,604		89	3	81	10	15	8	137	260	79	149	43	222	657	34	8	1785		571		146		
Greensboro	White	5,500	8,000	0	0	0	0	0	0	0	2	1	2	2	4	7	0	0	18	25	13	13	0	0	For six months—January, February, April, May, June and July.
	Colored	2,500		0	0	1	0	0	0	0	0	0	1	0	1	4	0	0	7		0		0		
Lexington	White	1,800	2,100	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	5	7	2	2	0	0	For eleven months; November omitted.
	Colored	300		0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2		0		0		
Morehead City	White	1,385	1,620	0	0	0	0	1	0	1	1	2	3	0	2	4	1	0	15	20	8	11	0	1	For the first seven months.
	Colored	235		0	0	1	0	1	0	0	1	0	0	0	0	2	0	0	5		3		1		
Salisbury	White	3.500	5,000	2	0	0	0	0	0	1	5	5	0	1	3	12	0	0	29	62	5	9	2	2	For eleven months; December omitted.
	Colored	1,500		5	0	1	0	0	0	3	5	0	1	1	1	13	3	0	33		4		0		
Statesville	White	2,500	3,500	1	0	0	0	0	0	1	0	0	1	0	1	8	2	0	14	17	1	1	2	3	For ten months; February and October omitted.
	Colored	1,000		0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	3		0		1		
Warrenton	White	750	1,300	0	0	0	0	0	0	0	0	2	0	0	1	2	0	0	5	9	2	3	0	0	For ten months; April and June omitted.
	Colored	550		0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	4		1		0		
Washington	White	3,000	5,000	1	1	5	0	0	0	1	1	2	2	1	4	4	0	0	22	45	5	9	0	0	For six months—June, July, August, Oct., Nov. and Dec.
	Colored	2,000		1	1	1	0	0	0	1	2	2	0	3	4	8	0	0	23		4		0		

TABLE No. VI.—.SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1894.

TOWNS.	RACES.	POPULATION.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Under 5 Years		Still-born.		REMARKS.
		By Races.	Total.																	By Races.	By Towns.	By Races.	By Towns.	By Races.	By Towns.	
Asheville	White...	8,000	12,000	4	0	0	6	0	0	7	*31	1	10	1	11	30	2	1	0	104	157	27	43	6	10	
	Colored	4,000		2	0	0	0	0	0	3	9	4	3	0	0	25	1	0	0	47		16		4		
Charlotte	White...	9,000	15,000	9	1	3	1	0	0	9	18	5	1	5	21	47	3	0	0	123	258	47	88	11	24	
	Colored	6,000		10	0	4	0	0	0	11	26	13	9	4	11	39	8	0	0	135		41		13		
Durham..........	White...	4,500	8,000	1	0	0	0	0	0	4	7	2	2	1	5	13	0	0	0	35	46	4	6	1	1	
	Colored	3,500		3	0	0	0	0	0	2	1	0	1	0	0	3	0	0	1	11		2		0		
Fayetteville	White...	2,800	5,000	2	0	4	0	0	0	0	4	4	2	1	2	19	2	0	0	40	80	13	24	1	4	
	Colored	2,200		0	0	5	0	0	0	2	3	0	2	2	2	23	1	0	0	40		11		3		
Goldsboro.........	White...	3,000	5,000	0	0	4	0	0	0	3	4	1	1	0	6	17	1	0	0	37	62	11	22	1	2	
	Colored	2,000		0	0	2	0	1	0	1	5	1	2	0	4	8	1	0	0	25		11		1		
Greensboro	White...	5,500	8,000	5	0	0	0	0	0	1	21	4	4	4	2	14	1	0	0	36	106	6	32	9	15	
	Colored	2,500		4	0	1	0	0	0	2	2	3	3	5	3	24	2	1	0	70		26		6		
Henderson	White...	2,250	4,250	0	0	0	0	0	0	1	2	1	0	0	1	9	0	0	0	14	45	1	10	2	5	
	Colored	2,000		2	0	0	0	0	0	2	9	2	1	0	2	13	0	0	0	31		9		3		
Hillsboro	White...	400	700	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	0	4	13	0	0	0	2	
	Colored	300		0	0	0	0	0	0	0	1	0	0	1	0	7	0	0	0	9		0		2		
Lexington........	White...	1,800	2,100	4	0	0	1	0	0	1	1	0	0	0	0	4	0	0	0	11	11	1	1	1	1	
	Colored	300		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0		0		
Marion......... ...	White...	650	800	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4	8	1	2	0	0	
	Colored	150		0	0	0	0	0	0	1	0	0	0	0	1	0	2	0	0	4		1		0		
Monroe............	White...	1,800	2,400	2	0	1	0	1	0	0	1	0	0	0	2	4	0	0	0	11	21	0	0	2	2	
	Colored	600		0	0	0	0	0	0	0	5	0	1	0	0	4	0	0	0	10		0		0		
Oxford............	White...	1,500	2,800	1	0	0	0	0	0	0	2	3	2	0	2	9	0	0	0	19	37	2	10	2	5	
	Colored	1,300		1	0	0	0	0	0	3	3	3	0	2	2	4	0	0	0	18		8		3		
Pittsboro	White..	350	600	0	0	0	0	0	0	2	0	0	0	0	0	3	0	0	0	5	7	0	0	0	0	
	Colored	250		0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2		0		0		
Raleigh...........	White...	8,000	15,000	6	0	2	1	0	0	11	15	11	9	4	18	46	3	0	0	126	277	39	94	8	29	
	Colored	7,000		0	0	2	0	1	0	8	18	11	9	6	11	80	4	0	1	151		55		21		

*Of this total 26 deaths, of consumption, were of visitors.

TABLE No. VI.—Showing Causes of Death, etc.—Continued.

TOWNS.	RACES.	POPULATION.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Under 5 Years.		Still-born.		REMARKS.
		By Races.	Total.																	By Races.	By Towns.	By Races.	By Towns.	By Races.	By Towns.	
Rockingham....	White...	1,300	1,750	1	0	0	1	0	0	2	5	3	1	0	3	0	0	0	0	16	19	1	1	0	1	
	Colored	450		1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3		0		1		
Rocky Mount..	White...	1,200	1,600	2	0	1	0	0	0	2	1	0	0	0	3	2	0	0	0	11	17	0	0	0	0	
	Colored	400		1	0	0	0	0	0	1	2	0	1	0	0	1	0	0	0	6		0		0		
Salem	White...	3,942	4,284	2	1	0	1	0	0	0	3	1	3	0	7	18	0	0	0	36	44	17	19	3	3	
	Colored	342		0	0	0	0	0	0	1	1	0	1	0	2	3	0	0	0	8		2		0		
Salisbury	White...	3,500	5,000	2	0	0	0	0	0	2	4	7	0	0	10	1	1	0	0	27	54	2	9	2	3	
	Colored	1,500		0	0	0	0	0	0	3	5	1	1	1	13	3	0	0	0	27		7		1		
Scotland Neck..	White...	700	1,100	0	0	1	0	0	0	0	0	3	0	1	1	3	0	0	0	9	24	7	14	0	0	
	Colored	400		0	0	1	0	0	0	1	2	1	0	0	1	9	0	0	0	15		7		0		
Southport	White...	750	1,200	0	0	2	0	0	0	1	0	2	0	0	1	2	0	0	0	8	15	4	6	0	0	
	Colored	450		0	0	1	0	0	0	0	2	0	0	0	0	4	0	0	0	7		2		0		
Tarboro	White...	1,258	2,370	0	0	2	0	0	0	1	2	0	3	0	2	5	0	1	0	16	34	3	5	0	0	
	Colored	1,112		0	0	2	0	0	1	1	2	0	3	0	3	6	0	0	0	18		2		0		
Warrenton	White...	750	1,300	0	0	0	0	0	0	0	0	0	3	0	1	2	0	0	0	6	7	2	2	0	0	
	Colored	550		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1		0		0		
Washington	White...	3,000	5,000	1	0	0	0	1	1	1	3	2	0	0	1	23	1	1	0	35	100	5	22	1	1	
	Colored	2,000		2	0	3	0	2	0	1	5	2	5	1	0	41	3	0	0	65		17		0		
Weldon	White...	700	1,500	1	0	0	0	0	0	0	0	1	1	0	4	5	1	0	0	13	*30	4	6	0	1	
	Colored	800		0	0	2	0	0	0	0	7	0	1	0	0	6	1	0	0	17		2		1		
Wilmington	White...	9,000	22,000	2	2	3	0	0	0	5	12	8	12	1	9	41	5	1	0	101	409	22	133	15	56	
	Colored	13,000		5	1	16	0	0	0	14	19	25	13	0	29	147	9	0	0	308		111		41		
Wilson	White...	2,000	3,500	1	0	2	0	0	0	0	5	1	1	2	4	19	1	0	0	27	53	6	17	6	6	
	Colored	1,500		0	0	1	0	0	0	2	0	0	0	0	4	19	0	0	0	26		11		0		
Winston	White...	5,200	10,000	3	0	0	1	0	0	3	6	10	2	1	5	19	2	0	0	52	185	22	68	7	7	
	Colored	4,800		4	0	9	0	2	0	3	45	4	10	0	22	39	4	0	0	133		46		10		
Total, 28 towns	White...	82,850	142,254	51	4	25	12	2	1	56	127	70	57	24	122	348	23	4	0	926	2113	217	631	79	188	
	Colored	59,404		35	1	40	0	6	1	63	222	70	67	22	112	509	36	1	2	1187		387		109		
Grand Total...	....	112,254		86	5	65	12	8	2	119	349	140	124	46	234	857	50	5	2	2113		634		188		

*Of this total 5 deaths were of visitors, two of them accidents.

TABLE No. VI.—SHOWING CAUSES OF DEATH, ETC.—CONTINUED.

TOWNS.	RACES.	POPULATION.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accidental.	Suicide.	Violence.	Total Deaths.		Under 5 Years.		Still-born.		REMARKS.
		By Races.	Total.																	By Races.	By Towns.	By Races.	By Towns.	By Races.	By Towns.	
Jacksonville....	White.	400	600	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	2	3	0	0	0	0	For five months, Aug., Sept., Oct., Nov. and Dec.
	Colored	200		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1		0		0		
Lenoir......	White...	800	1,000	1	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	6	10	2	4	0	0	For nine months, Jan., Feb. and March omitted.
	Colored	200		0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4		2		0		
Statesville..	White...	2,500	3,500	0	0	0	0	0	0	0	0	2	0	0	2	6	0	0	0	10	13	0	0	0	0	For eleven months, December omitted.
	Colored	1,000		0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	3		0		0		

SPECIAL WORK OF THE BOARD SINCE THE LAST ANNUAL REPORT OF THE SECRETARY TO THE CONJOINT SESSION OF THE BOARD AND STATE MEDICAL SOCIETY.

REPORT ON SANITARY INSPECTION OF THE STATE INSTITUTIONS, AND THE WATER SUPPLY AND SEWERAGE DISPOSAL OF CITIES.

By J. C. Chase, Engineer of the Board.

In accordance with the action of the State Board of Health at a meeting held at Salisbury on the 14th of September I have made a sanitary inspection of the various public institutions and cities of the State, and submit the following report:

The institutions visited are as follows: The Hospitals for the Insane at Raleigh, Morganton and Goldsboro; the Penitentiary and the Convict Camps on the Roanoke and at Castle Hayne; the Agricultural and Mechanical Colleges at Raleigh and Greensboro; the Schools for the Deaf and Dumb at Raleigh and Morganton; the Schools for the Blind at Raleigh; the State Normal School at Greensboro, and the University at Chapel Hill.

I find the sanitary conditions at these various places generally good, taking into account the limitations of the surroundings and specific use of the premises. The buildings are universally situated on eminences of more or less prominence, so that the question of surface drainage has naturally settled itself. The natural surroundings have been improved as a general thing and the grounds are usually well kept and attractive. This feature undoubtedly has a greater effect on the health, happiness and general well-being of those subjected to its influence than on first thought would be deemed possible, and therefore merits attention in a sanitary inspection.

THE HOSPITALS FOR THE INSANE.

The one at Raleigh gets its general water supply from a small branch over a mile distant, which is pumped to tanks in the attic. The supply for culinary purposes is stored in closed tanks. Drinking water is procured from a deep well and a spring, the latter being several hundred feet from the building and at a much lower elevation. The sanitary fixtures are of an antiquated type and could well be supplanted with something more in accordance with modern ideas. Ventilation of the closets is effected by a downward draught, caused by a connection with the hot air flue of the chimney. Apparently it is not always reliable. The building is heated by steam, with indirect radiators in the basement, fresh air being supplied through an underground conduit by a large rotary fan in the boiler-house. Ventilation is accomplished by means of flues running to the attic, with registers in each room, the attic being provided with suitable ventilators. The state of the weather being such that the windows were generally open, I could not say how thoroughly the wards were ventilated. The sewage is discharged into a branch about one-fourth of a mile distant. On account of the slight flow of water in the branch at times a good deal of the filth is deposited not far from the outfall. A small, covered catch-basin at the outlet of the sewer to retain the solids would abate this nuisance, and the contents could be removed and buried from time to time or used in a compost heap.

The general condition of the institution and its surroundings is satisfactory. The water-closets in the administration building should be replaced at once with an improved kind, for the impression it would have on visitors, if for no other reason, and a better system of filtration would no doubt render the present water supply suitable for all purposes, which would add much to the conveniences of the institution.

At Morganton the water supply comes by gravity from a mountain stream, some five miles away, and its quality is first-class. This supply not being fully adequate, another for use in an emergency has been obtained from driven wells located in a valley about one-third of a mile away.

The sanitary fixtures, heating and ventilation are virtually the same as in the institution at Raleigh, except that this being of more recent construction many improvements in details have been made. The sewage is discharged at a good distance from the buildings and everything pertaining to the sanitary equipment is maintained in a high degree of efficiency. I consider, however, that the type of water-closet in the wards could be changed to advantage when the proper time comes.

The Goldsboro institution gets its water from Little river, only a few hundred feet away. It has also had an artesian supply, which is not now in use on account of some defect in the well. The river water is more or less turbid at all times, and I consider filtration desirable and essential. The sewage is discharged into deep water in the same stream, some distance below the pumping station, and in this particular the institution is more favored than any other in the State.

The building is heated with hot air, a large rotary fan in the boiler-house forcing a supply of fresh air through a large box coil of steam-pipes and delivering it to registers in the corridors and rooms. The ventilating is done by the usual flues. The plumbing was thoroughly overhauled a few years ago, the "Durham" system of house drainage being put in. The fixtures require a little more attention than they have had, and if the suggestions and instructions given are followed will probably operate better hereafter. I consider water-closets with automatic flushing far superior to the intermittent type, and fully believe that in four-fifths of the wards of all three institutions an automatic closet could be used with perfect satisfaction, and in this particular I consider that a very decided and desirable improvement can be made.

THE PENITENTIARY AND CONVICT CAMPS.

The water supply of the Penitentiary comes from springs located in the excavation of the old quarry just outside of the enclosure. A large quantity is in this basin and care is taken to exclude all surface drainage. The water appears to be of excellent quality, but is not used for drinking purposes, that being supplied from another source. The heating, which is done by steam, sanitary arrangements and ventilation are all of the usual character found in such institutions, and due regard appears to be paid to the health and comfort of the prisoners.

The water-closets and urinals in the hospital and administration departments could be very materially improved upon, but there is no immediate necessity of a change. When it takes place, however, all wood-work about urinals and closets should be dispensed with, tiling being used instead. The sewage is discharged just outside of the wall, and I should consider it advisable to continue the pipe a few hundred feet further to a branch. If the flow of water should be insufficient to carry off the filth it would be necessary to put in a catch-basin to retain the solids, as described on a preceding page. The hog-pens are in close proximity to the prison, and I fear if they were owned by other parties they would be adjudged a nuisance by the prison officials.

The convict camps are in good condition and faithfully cared for. The water supply comes from deep and driven wells and appears to be of good quality. The privies receive careful and systematic attention each day and are kept in far better condition than those of the same type in any other State institution, and I doubt if the care taken at the camps is excelled anywhere. At Castle Hayne the percentage of sick was very much larger than at the other camps, but they were principally malarial cases and are no doubt caused by the large amount of excavation going on. I would advise the construction of cisterns at this camp in order to provide a supply of drinking water, but care should be taken to have the roofs washed clean from any deposit of dust from the ground rock before collecting the water. At all of the camps I consider it advisable to carry the foul water by a drain-pipe to a much greater distance than is now done, as there is considerable stagnant water in all of the open drains. In three cases an extension of a few hundred feet will reach running water. At Caledonia a large amount of ditching has been done and the draining of the swamps has resulted in a great improvement in the health of the convicts.

THE A. & M. COLLEGE AT RALEIGH.

This institution gets its supply of water from a large well on the premises. There are no sanitary fixtures in general use on account of the difficulty of disposing of the sewage, objections having been made to discharging it into the nearest branch by parties living farther down. The kitchen wastes are discharged at a good distance from the building and on a lower level than where the well is located.

The privies are of the box pattern and are not as well taken care of as is desirable. The old well on the campus, which is used very little, if any, should be discontinued entirely. I see no reason why the sewage of this institution could not be disposed of with good success by surface irrigation, or filtration, and the resulting effluent could be discharged into the neighboring branch without any danger of causing a nuisance.

THE A. & M. COLLEGE AT GREENSBORO (COLORED).

This institution was not entirely completed at the time of my visit.

The only water supply is a comparatively shallow well near the kitchen. The water was somewhat turbid on account, I presume, of the newness of the well. The kitchen slops are thrown out in the rear of the building. Ordinary surface privies are the only convenience of the kind available. It is hardly to be expected, perhaps, that sanitary fixtures would be provided where a supply of water was not easily available, and where the question of sewage disposal might be a troublesome one, but to erect a building of this character in this age of the world without providing in the least for the future addition of such conveniences is a serious reflection on the intelligence or far-sightedness of some one.

A supply of water should be delivered into the kitchen, at least, and a suitable drain-pipe provided to take the waste water to a point where it can be discharged with impunity; certainly to a point beyond all danger of contamination to the present water supply. The sewage of this institution could probably be successfully disposed of by surface irrigation. The buildings are heated by hot water and the school building has the usual type of flue ventilation, but the flues terminate in the attic, of which there is no means of ventilating except by the windows.

THE SCHOOL FOR THE BLIND AT RALEIGH.

The water for general purposes comes from large wells on the premises and when the quantity they yield is insufficient the deficiency is made up by drawing from the city water-works. The drinking water comes from another well used exclusively for that purpose, and appears to be of good quality. The plumbing has lately been reconstructed and is now in good condition, with fixtures well adapted to the use required. The building is heated by steam. The rooms containing the water-closets require better ventilation and a device was suggested to the Superintendent to be put in the upper sash of the window. The general condition of the grounds and buildings is a credit to those in charge.

THE SCHOOL FOR THE DEAF, DUMB AND BLIND AT RALEIGH (COLORED).

The greater portion of the water used comes from a deep well on the premises, and the balance from the city water-works. The building is heated with steam and connected with the city sewerage system. The only means of ventilation are the windows and doors. The water-closets are of the latrine type and something better is imperatively needed in the interests of cleanliness and decency. The room containing the closets for the girls should be better ventilated. Some explanations and instructions given to the new Superintendent will probably tend to better the state of affairs to some extent. In other respects nothing was noticed that calls for mention.

THE SCHOOL FOR THE DEAF AND DUMB AT MORGANTON.

This institution has been in operation but a few weeks, and the building and fixtures were in an unfinished state at the time of my visit. The water supply is derived from deep pipe wells situated in a valley about one-fourth of a mile from the buildings, and is first-class in quality. The sewage is discharged about the same distance away and on a lower level and at some distance from the source of water supply.

The building is well supplied with water fixtures of the proper design and well arranged. Heating is done by steam, direct-indirect radiators being used in the rooms, with air-ducts extending through the exterior walls of the building, so that a supply of fresh air is available, if the matter receives proper attention. Ventilation is secured by floor and ceiling registers opening into flues that extend through the roof.

This being the newest institution, it is only reasonable to expect that its sanitary equipment should be an improvement upon those previously built. Dr. R. H. Lewis, Secretary of the Board, accompanied me, and a more detailed report of our visit has been sent to the Superintendent of the school, to whom we are indebted for many courtesies.

THE STATE NORMAL SCHOOL AT GREENSBORO.

This school has been in operation but a few years, and therefore the buildings are of modern construction. They are heated by steam, with radiators of the direct-indirect type, so that a supply of fresh air is insured. The rooms are ventilated by the usual style of flues, with floor and ceiling registers. The water supply for domestic purposes comes from the city water-works system and the drinking water from a deep well on the grounds. The building has been arranged for sanitary fixtures, but they were omitted on account of the difficulty of sewerage disposal.

At present the kitchen wastes are discharged through a drain into a water course several hundred feet distant. The privies are of the usual box type, and are apparently well taken care of.

THE UNIVERSITY AT CHAPEL HILL.

There were no sanitary conveniences at the University until last year, when the basement of the library building was fitted up for that purpose with a fair number of water-closets, urinals, bath-tubs and shower-baths for the number of students in attendance.

The water supply comes from a deep well on the campus, sunk for the purpose, and is pumped by steam to tanks in the attic of one of the buildings. A number of fire hydrants have been put in; also several attachments where a convenient supply of water for the dormitories may be drawn. At these places provision has also been made for emptying the slops from the rooms, suitable connections with the sewer having been put in. The pipes have also been extended to the various laboratories. where a supply of water has been very much needed.

The sewage is discharged into a small branch about a thousand feet from the buildings, and no fear of trouble arising from that method of disposal is apprehended. The supply of drinking water is supposed to come from the old well on the campus. but as the new supply is rather more convenient. and is also equally as palatable, it will no doubt be used to a greater or less extent. and it behooves those in authority to see that the new well is kept free from contamination.

A statement of the visits to the various cities follows in detail.

ASHEVILLE.

The water-works are owned by the city. The supply comes from the Swannanoa river, several miles away, filtered by a mechanical plant, so that a more or less turbid supply is made highly satisfactory. The filter plant has been doubled in capacity the past year. The isolation of the plant would incline one to the belief that there is danger of its not receiving the attention necessary to insure the best results.

The city has a sewerage system built from plans furnished by E. W. Bowditch, C. E., which is apparently complete in all of its parts, except the omission of automatic flush-tanks. The outfalls into the river should be extended a few feet, so as to discharge into deep water. As it is, quite an amount of filth is deposited near the outlets at certain stages of the water, and even if it has no deleterious effect on the neighboring inhabitants, it certainly does not add to the attractiveness of the locality. The outfall that empties into the creek should be extended several hundred feet to the river, as quite a nuisance is created below the present point of discharge, and it is not to be wondered at that complaint has already arisen.

By desire of the Mayor I visited the city market, guard-room, some of the school buildings and library; also the Normal and Collegiate Institute. I am pleased to say that the sanitary arrangements at these various places are generally satisfactory and kept in good condition. The County Home was also visited with the Superintendent of Health. The location, surroundings and general appearance suggested nothing requiring criticism. The jail is a brick structure of the modern type, with the usual sanitary arrangements. On account of the United States Court being in session the jail was in a very overcrowded state, no less than *ninety-five* being confined in quarters intended for hardly more than one-third of that number. The cage was crowded to such an extent that the victims had literally standing room only, and the foulness of the atmosphere and filthiness of the surroundings are virtually indescribable.

If, as was intimated, the cupidity of the sheriff contributed to bring about this particularly reprehensible state of affairs it is high time that the community should rise in indignant protest and demand a more humanized and enlightened service from its officials. If the Government officials are alone responsible, then it is a pity that the much vaunted "strong arm of the law" cannot reach the offender and correct an abuse that would lead to the indictment of the perpetrator in many parts of the country, even if the victims were nothing but brutes. I am informed that the ordinary condition of the jail is creditable to the person in charge. The sanitary conveniences of the court-house are not a credit to the county.

CHARLOTTE.

Water-works owned by a company. Supply taken from two small streams in the outskirts of the city. Water-shed of one is reasonably free from danger of pollution, that of the other is open to some suspicion. The supply becomes quite turbid at times from surface washings in spite of precautions taken to remedy the difficulty by separation and sedimentation. A filtration plant would seem to be the best and perhaps the only solution of the question of a satisfactory water supply for this city. The condition here, however, is no worse than it is in several other cities of the State. The city is well sewered, but some of the outlets should be extended a few hundred feet to deep water, in order to abate a nuisance that exists at these outfalls.

The close proximity to the city of the streams into which the sewers discharge will require, at no distant day, the construction of two intercepting sewers, in order that the sewage may be carried to a sufficiently remote point before its final discharge. The system is not provided with manholes to any extent, or with automatic flush-tanks, and in that respect is not up to the standard of present practice in sewer construction.

CONCORD.

This city has a small system of water-works owned by an individual. Source of supply, a well, fed by a deep-seated spring, near the center of the town. The water appears to be first-class, and the only criticism to be made is that greater precautions should be taken against pollution by an inflow of surface water, or foreign substances dropping into the well. The owner very cheerfully expressed his willingness to raise the wall and ground about the well so that surface water would flow away from it, and also enclose the well with a roofed building.

No sewerage system. Deep wells, or cess-pools, are used by parties having water-closets. Such devices merit general condemnation, as they are a perpetual menace to the healthfulness of the habitations using them, and are only tolerated as useful nuisances. The local conditions are such that a suitable sewerage system could be provided at a moderate cost, as there is no uncertainty about the locality of disposal, the distance to which it would have to be carried is not excessive and the fall would be ample.

DURHAM.

The water supply comes from an impounded branch some eight miles from town, the reservoir being on a hill about six miles away. The water became very turbid after rains and a filter plant was put in last year. The results have been exceedingly satisfactory and the water supplied to this city is equal in appearance to that supplied to any city in the State. Alum is used as a coagulant. The works are owned by a company. No sewerage system, which is rather a reflection on the enterprise of this progressive and wide-awake city.

ELIZABETH CITY.

No water-works or sewerage. Rain-water cisterns and driven wells in general use. Experiments have been made to obtain a supply from artesian wells, but the results were unsatisfactory. Prospective source of supply would be the Pasquotank river above the town, which would furnish a juniper water of presumably good quality. Sewerage disposal would be rather difficult on account of the flatness of the town site and its very slight elevation above the river. Surface drainage needs attention and the small creeks that intersect the town should be dredged or cleaned out, and the adjacent swamps drained, the grade being raised if practicable by filling in. County Home compares favorably with other like institutions. Surface drainage and an open ditch carrying waste water should have attention, and the advisability is questioned of continuing to use the exceedingly shallow wells on the premises when a plentiful supply from a lower depth could be had by another driven well. The jail is a brick structure of modern design, but had no occupants at the time.

FAYETTEVILLE.

A water-works system built by a company was put in operation last year. Supply taken from an old mill-pond on a creek about one and one-half miles from the city. The pond is fed by springs to a great extent and the water-shed is quite free from danger of pollution. Some surface washing after heavy rains makes the water turbid near the pumping station, but this can be very easily remedied by an intercepting ditch, and should this be done this city will have apparently the best natural water supply in the State. There is also a small gravity system which has been in use for sixty-five years. No system of sewerage. The prospective means of disposal would be the river, or the creek below the lowest dam. A meeting of the County Board of Health was held in order that I might meet them.

GREENSBORO.

Water-works owned by a company. Supply comes from a creek about a mile from the city. The creek is very muddy at times and an effort is made to insure clear water by storing the normal flow in a settling basin to be used as a supply during the time the creek is at its worst.

This scheme is evidently not an entire success, and this system is unqualifiedly one where filtration should be adopted. Plans were prepared some years ago by E. W. Bowditch, C. E., for a system of sewers, and one outfall and a small portion of the system has been built. It was intimated that some changes in the plans were contemplated, but it is to be hoped that such will not be the case, at least without the advice of a competent engineer, as the one who furnished the plans is without question more of an authority on the subject than any municipal committee on sewers. The jail was visited by request and in company with one of the prominent physicians. The sanitary conveniences are of the most primitive type and a disgrace to the county, when it is taken into account that the jail is situated in the heart of a flourishing city, which is provided with water-works and sewers. The surface drainage also needs attention.

GOLDSBORO.

Water supply under private ownership, and derived from Little river, one and one-half miles from the city. Water very turbid at times and water-shed not above suspicion. This is considered a case where filtration is essential and if faithfully carried out would doubtless remove any proper cause for complaint arising from the character of the supply or local conditions of the water-shed. No system of sewers.

A franchise was granted last year but the parties have failed to materialize. The natural method of disposal would be by discharge into the Neuse or creeks tributary thereto, but the conditions are favorable for disposal by irrigation or filtration at a much nearer locality.

HENDERSON.

The water-works are owned by a company and have been in use for about three years. Supply derived from an old mill-pond on a small creek about two miles from town. The pond and creek are fed to quite an extent by springs, but the water becomes somewhat turbid from surface washings. The city supply is purified, however, by a filter built in a crib some distance from the shore, and the water furnished is apparently unexceptionable. The water-shed is reasonably free from danger of contamination, both present and prospective. Some apprehension has been expressed in regard to the drainage of a portion of the town reaching the pond through a small branch, in the event of the town being built up in that direction, but the danger can probably be avoided by cutting an intercepting ditch and diverting the drainage into a branch discharging below the dam. No sewerage system. The prospective disposal in the event of a system being built will apparently not be a serious problem.

NEWBERN.

Water-works with an artesian well supply have quite recently been put in operation. The works are owned by a company. An analysis shows the water to be of a satisfactory quality. Cisterns and driven wells are in general use. A sewerage system on the franchise plan has also recently been constructed. The sewage is discharged into the Neuse through two twelve-inch pipes terminating where the water is from eight to ten feet deep, some four hundred and fifty feet from the shore.

Some fears have been expressed in regard to a possible nuisance resulting from this method of disposal, but the quantity is so small, compared with the volume of water in the river, that I do not apprehend any trouble from that source. The sewer grades are so light, on account of the flatness of the country, that systematic and thorough flushing will be required to keep the system in good order.

RALEIGH.

Water-works owned by a company. Supply comes from Walnut creek, about two miles from the pumping station and above all supposed sources of contamination. The water is also filtered by one of the mechanical devices, alum being used as a coagulant to some extent. The water-shed is some ten miles long, fairly well settled, and as the population is naturally going to increase, the chances of specific pollution are also going to be greater each year. I consider the chances of good water for this city depend to a very great degree upon thorough and faithful filtration. A complete system of sewers designed by J. L. Ludlow, C. E., was built some years ago. The sewage is discharged through four outfalls into running water at a satisfactory distance from the city, and where no reasonable complaint can be made. The system is provided with automatic flush-tanks, but on account of a disagreement with the Water Company they are not used, the flushing being done once a week from a hydrant.

REIDSVILLE.

No public water supply, and a prospective source is not particularly manifest. The question of sewage disposal will be much easier of solution, for like all of the cities in the central and western sections of the State it is only necessary to take it far enough away and turn it loose. There will be no one farther down stream to be damaged, for several generations at least.

SALEM.

Public water supply owned by a company and derived from several springs of excellent quality. No sewerage system, but the city has the right to connect with the Winston outfall sewers, which pass through the city. The unsightly appearance of a small branch in the city would suggest the propriety of requiring the textile manufactory to discharge its wastes into the sewer. It may not be detrimental to the public health, but appearances should be considered to some extent.

SALISBURY.

Public water supply under corporate ownership. The water is taken from a small stream about two miles from the city. It is filtered by one of the mechanical devices, using alum as a coagulant. The resulting effluent is very satisfactory in appearance, and if the filtration is faithfully done the water supplied is no doubt above reproach, although the immediate surroundings at the point from whence the supply is drawn are not very inviting, as the stream flows through a swamp made of alluvial deposit, and at times the supply must be very turbid. A large amount of mud recently removed from the stand-pipe emphasizes the necessity of continuous and faithful filtration, and I believe it is only by so doing that this supply can be made a satisfactory one. The exigencies of the case would also demand a duplicate filter in order to secure the best results at all times. No sewerage system.

STATESVILLE.

The question of water-works has been discussed, but nothing has been done. The proposed source of supply is a small creek at some distance from town. It is safe to assume that the water will have to be filtered, as any stream in this locality would become very muddy after heavy rains. A sewerage system will not be a serious matter to arrange for when the time arrives.

TARBORO.

This city has put in a small water-works system for fire protection only. The supply being taken from a creek at a point below undoubted pollution, precludes the idea of the present system ever being used for domestic purposes.

Attempts have been made to procure an artesian supply, but the results have apparently not been very promising. The present domestic water supply is from dug and driven wells and rain-water cisterns. The most natural method of sewage disposal would be to discharge it into the Tar river and the problem would probably be easy of solution.

WASHINGTON.

No public water supply or sewers, and the question of providing either will be quite a serious one, as there is apparently no water available except the highly colored river water, which is also very muddy at times, and the natural surface of the ground is so slightly elevated above the river that it would be difficult to construct a system of sewers that would discharge into the river by gravity alone. The present urgent need of this place is surface drainage, as stagnant water was observed in at least two localities on inhabited lots. At the time of my visit a drain was being relaid for the purpose of abating a nuisance of this description. A shallow creek or branch, bordered by swamps, bounds one side of the town, and is without doubt a contributing cause for the large amount of malarial disorder prevalent. It is quite likely that the river water could be made a satisfactory source of supply by mechanical filtration, using the proper coagulant, and it is possible that an artesian supply might be obtained.

WILMINGTON.

Water-works owned by a company. Supply taken from the north-east branch of the Cape Fear river, about a mile above the city. An attempt was made to get a supply from an artesian well, but at a depth of five hundred feet a flow of saline water was struck and the experiment was abandoned. The present supply is of the same character as that found in the rivers in the eastern part of the State, and is also somewhat turbid at times on account of the muddy water of the other branch of the river being backed up by the tide. Frequent and recent analyses show this water to be of fair quality, or as good as waters of this class are generally found, and free from any specific pollution. The erection of a filter plant is now under consideration and will probably be done at an early date. The city has no system of sewers, although plans for one were prepared by Rudolph Hering, C. E., some years ago. A large number of private sewers have been laid, but no definite plan has been followed, the pipe has not been laid to the proper depth, there are no man-holes or arrangements for flushing, and all that has been done on this line will be virtually thrown away whenever the time comes for constructing a complete system. This city, however, is not the only one that has followed this short-sighted policy. The County Home and Jail are brick structures recently built and well adapted for the purposes for which they were designed. The sanitary condition of each is good.

WILSON.

The water-works are owned by the city and have been in use a little more than a year. The supply comes from Toisnot creek, about one and one-half miles from town, and above any possible source of prospective sewage contamination. The water is variable in quality, as the creek becomes turbid after rain, and the only method of improving its condition is by a small settling basin across which the full flow of the creek passes. At its best the water is of good quality, apparently, but as the creek drains a swampy region we would naturally expect an excess of organic impurity at certain seasons of the year.

While this supply takes a high rank among the natural water supplies of the State, we consider it advisable and necessary that it should be filtered, and the presence of good material near by would render the solution of the problem quite an easy one, when the small quantity of water consumed is taken into account. Plans for a comprehensive system of sewers have been prepared by J. L. Ludlow, C. E., and it is expected that some portion of the system will be built the coming year. The plan provides for the discharge of the sewage by several outfalls into creeks at a good distance from the town, and if the specifications submitted are intelligently carried out we have no doubt of the results being perfectly satisfactory.

WINSTON.

The water-works built by a company some years ago have been purchased by the city and an additional supply is being obtained. The present supply is from wells and the new one is a small branch fed by springs, which gives a very satisfactory water when not turbid from heavy rains.

Intercepting ditches have been cut to keep out muddy water from quite a portion of the water-shed as well as any household drainage. An ingenious device will be used to keep the muddy storm water from the upper end of the branch out of the clear water basin, and, in addition, the new supply will be passed through a mechanical filter. The water-shed is quite free from danger of pollution and with a slight amount of attention to guard against contamination this city will have a water supply equal, if not superior, to any in the State. A system of sewers was built a few years ago from plans of J. L. Ludlow, C. E. The outfall empties into a deep water creek at some distance from habitations, and where the effluent should cause no complaint.

SUMMARY.

To summarize: Of the twenty cities visited sixteen have water-work systems, fifteen of which supply water for domestic use. Thirteen of the systems have corporate ownership. Of the fifteen six make use of filtration in order to furnish a satisfactory supply, and it is considered that the supplies of five others should have the same treatment; the four remaining seem to require no attention at the present time.

Of the fifteen cities with domestic water supply only five have systems of sewerage in operation, either wholly or in part, while two others have had plans prepared of which they have made no use.

ANALYSES.

Analyses of the water supplies for institution or city use have been available in only a few cases, and but few of those are entitled to much credence, as they are not of recent date. It is now a well-settled fact that in order to know the true character of a water supply it should be examined frequently, and I consider it essential that a chemical analysis be made of a sample from each source of supply at least once a year, and that a bacteriological examination be made as well. In this way only can we get an intelligent idea of the true character of the water supplied to our citizens or be made aware of the changes that are taking place. Semi-annual or quarterly examinations would be still more desirable.

DISPOSAL OF GARBAGE.

Although not mentioned specifically as one of the objects of this inspection, I have taken occasion to inquire into the methods of disposal in the various cities of what is known as garbage; that is, the rubbish from houses, stores, lots and streets. I find that the usual custom is to have it carted away by the city teams and deposited where it is supposed no offense will be caused, which result is not universally the case. In a few cities the accumulation is burned from time to time, but not until it has a chance to be pretty thoroughly overhauled by the local rag-pickers. Our cities are too small, with perhaps two or three exceptions, to adopt a system of garbage cremation, and the method above mentioned is probably the best to pursue under existing circumstances, but it is highly desirable that the places for dumping should be at a distance from habitations and in some suitable excavation that will prevent the loose stuff from being promiscuously strewn about the vicinity. The burning should take place as soon as sufficient has accumulated to make a satisfactory fire, and it is questionable if the overhauling of the rubbish by the rag-pickers should not be prohibited, for reasons that hardly need setting forth.

It would hardly seem necessary to say that such material should never be used for filling streets, yet such has been the case in some of our cities and in close proximity to habitations.

The stable manure is usually hauled away by the farmers for fertilizing purposes. The contents of the privies in many of the smaller cities are buried on the lot from time to time, and, as no effort is made to have it absorbed by contributing to plant growth, the condition of the well waters in the vicinity must sooner or later cause apprehension.

In the larger cities the privies are usually cleaned by scavengers who dispose of the *excreta* by dumping it on waste land at a distance from the city. Sometimes it is buried at a much nearer point and occasionally a portion finds its way into a compost heap.

The owner, or occupant, makes his own trade with the scavenger, and frequently the mandatory powers of the city health officer are required to insure that the matter has proper attention. Inasmuch as the expense is borne by the individual in any event, it would seem advisable to have the city assume the work of cleaning the privies and provide for the expense in the general tax levy, It would then be done more methodically, with greater efficiency and with probably no more expense to the average taxpayer; certainly no more than it will cost him if he has been in the habit of having the work done properly heretofore.

These matters, excepting the financial part, are all within the purview of the local health officer, who is usually reasonably faithful to his trust and if the state of affairs is not satisfactory it is more probable that it results from the interference of some ward politician than the efficiency of the health officer. It is seldom that the latter is able to hold his own and require a faithful compliance with the sanitary ordinances when the offender is a person of wealth and influence and chooses to make a fight.

RECOMMENDATIONS.

The character of the water used in the manufacture of ice should also receive attention, and I consider that it is desirable and proper that the Board should take some action in this line. The quality and character of the milk supplied for city use would also be a legitimate field for investigation, and it is popularly assumed that the milk question and the water question are not very distantly related.

In conclusion, I desire to acknowledge my indebtedness to the various officials and citizens with whom I have been brought in contact during the past few weeks, and extend to them my hearty thanks for their attention and cordial co-operation in enabling me to carry out the work in which I was engaged.

WILMINGTON, December 29, 1894.

QUARANTINE STATION AT SOUTHPORT.

In obedience to instructions given by the Board at its annual meeting at Greensboro I addressed the following letter to Surgeon General Wyman of the United States Marine Hospital Service:

NORTH CAROLINA BOARD OF HEALTH,
SECRETARY'S OFFICE,
RALEIGH, N. C., May 25, 1894.

Walter Wyman, M. D., Supervising Surgeon General United States Marine Hospital Service, Washington, D. C.,

DEAR SIR:—After a conference with Passed Assistant Surgeon J. J. Kinyoun, representing yourself and the Service, the North Carolina Board of Health, at its recent meeting on the 16th instant in the city of Greensboro, unanimously passed the following motion:

"Moved, that in view of the inability or unwillingness of the city of Wilmington to contribute its part towards carrying out the act of the last General Assembly providing for the erection of a first-class quarantine station at Southport, the Secretary be instructed to officially request the United States Marine Hospital Service to take charge of and operate that station; and that the Secretary be authorized to explain this action on the part of the Board."

In obedience to the instructions above given I hereby officially request you, as representing the United States Marine Hospital Service, to take charge of and operate the quarantine station at Southport.

Should you accede to our request, thereby bringing your Service into closer relations with our Board, we feel that we can count with confidence upon a continuance of the same cordial spirit of co-operation that has always existed between us.

In explanation of the action of the Board I would say: Dr. George G. Thomas, a member of our State Board of Health and Secretary of the Board of Quarantine of the Port of Wilmington, N. C., realizing the importance of a first-class quarantine station at the mouth of the Cape Fear, has been working for it for many years. At the last session of the General Assembly, in 1893, ably assisted by Dr. T. S. Burbank, of the Board of Quarantine, and others, and by the cholera scare, he succeeded in obtaining an appropriation by the State for that purpose of $20,000, conditioned, however, upon its being supplemented by an appropriation to the same object of $5,000 on the part of the city of Wilmington. The Board of Aldermen of that city at a recent meeting declined to make the appropriation, and appointed a committee to confer with you on the subject.

While the sentiment of the State Board of Health is in favor of local control as far as practicable, it was, as above stated, unanimous in the opinion that, under the existing circumstances, it would be best for you to take charge of this station. We trust you can do so.

The Board regretted your inability to be present in person; but as that could not be, they appreciated your sending as your representative, in response to our invitation, one so agreeable and so entirely acceptable in every way as Dr. Kinyoun.

Hoping that we may look forward to the pleasure of having you with us at some meeting in the near future, I am

Very respectfully yours,

RICH'D H. LEWIS,

Secretary.

The trust was accepted by the Marine Hospital Service, and I am glad to say that Congress has appropriated $25,000 for the construction of a station with all the modern improvements and $5,000 a year for its maintenance. The plans have been drawn and the station will no doubt be completed and equipped by the time the quarantine season arrives.

While it is of the greatest importance that every means should be utilized to prevent the introduction of infection from abroad, and while our city of Wilmington and our

State at large have a right to feel safer with such a station as that contemplated at the mouth of the Cape Fear, simple justice requires that we should call attention to one fact. It is this: Dr. W. G. Curtis, who has been quarantine officer at Southport for nearly twenty years, although supplied only with the crudest and most inadequate appliances, has, by his skill, alertness and attention to duty, prevented the entrance of infectious diseases. It is to be hoped that his merit will be rewarded by his retention in his present position by the United States Government.

ANALYSES OF DRINKING WATER.

The Board of Health desires to place on record its appreciation of the kindness of the North Carolina Agricultural Experiment Station, Dr. H. B. Battle, Director, in making a large number of chemical analyses of drinking waters and of the United States Marine Hospital Service, Walter Wyman, M. D., Supervising Surgeon General, and Passed Assistant Surgeon Jos. J. Kinyoun, Superintendent of Laboratory, for bacteriological examinations.

The only chemical analyses of special interest have already been referred to in the report on the water supply of Goldsboro.

The bacteriological examinations were of two samples taken respectively from the lower well and the lower spring at the Caraleigh Mills near the city of Raleigh, among the operatives of which typhoid fever was prevailing. All those attacked obtained their drinking water from the lower well. The examination of this water, while not revealing the bacillus of Eberth, the specific germ of typhoid fever, showed the presence in very large numbers of the *bacillus coli communis*, thereby demonstrating its "strong contamination with fecal matter." As the first case of fever made its appearance two months before the examination was made, and as the typhoid bacillus is not so viable as other intestinal species, the inference was drawn that the lower well was in all probability the source of infection.

It is proper in this connection to say that the Marine Hospital Service has kindly offered to give in its laboratory at Washington free a six weeks' course of instruction in practical sanitary bacteriology, including the bacteriological examination of drinking waters, to accredited representatives of the State Board of Health. Drs. Albert Anderson of Wilson and W. T. Pate of Gibson Station, having expressed a desire to take this course, and also having agreed to do a reasonable amount of work for the Board without charge, were duly commissioned and will go on about the middle of January.

The specific contamination of drinking water can only be ascertained by the bacteriologist. The prompt and certain discovery of the source of infection is all-important in the prevention of a spread of the disease. It is evident, therefore, that we may expect much good to result to the people of the State from having in our midst skilled men in the service of the Board.

While it has no bearing on drinking water we desire to make our acknowledgments to the Marine Hospital Service for a further offer of instruction in the bacteriological diagnosis of diphtheria to representatives of the State Board and of municipal Boards of Health in cities of 10,000 or more inhabitants. Since the discovery of antitoxine and the demonstration of its power as a cure for diphtheria, provided it be administered soon enough, the early diagnosis of the disease is of vital importance, and in many cases that can only be done with the microscope. It is also a sure and safe preventive of the disease, so that upon its appearance in one of a family of children the rest can be immediately made safe against it. Our cities and larger towns will no doubt avail themselves of the kind offer made, and another advance in the cure and prevention of one of the most justly dreaded diseases will be recorded in our State.

THE MONTHLY BULLETIN.

This publication of the Board, besides being a monthly record of the health of the people of the State and the condition of the jails and county homes, is a medium of communication with those whose active interest in sanitation it is most important to secure. It is sent as second-class matter, at a monthly cost in postage of about sixty-five cents for 1,250 copies, to health organizations, public libraries, etc., throughout the country, and in this State to all members of the North Carolina Medical Society and all other physicians who wish it; to the health officers and Mayors of cities and towns; the chairman of every Board of County Commissioners, and to every one who takes sufficient interest in sanitary matters to ask for it.

As the physicians, owing to the nature of their calling, come more closely in contact with the people in the work we have in hand and can do more than any others in impressing upon them the importance of observing the laws of hygiene, its editorial columns have been utilized particularly to secure their active co-operation in our work. The following editorials selected from the files of the past two years will give an idea of what we have tried to do in this direction:

IN RELATION TO CONTAGIOUS DISEASES IN NORTH CAROLINA.

Two weeks ago a copy of the new Act Relating to the Board of Health, ratified March 1, 1893, together with a copy of Instructions for Quarantine and Disinfection, prepared by the Secretary of the State Board of

Health in accordance with the requirement in section 9 of the act, and therefore a part of the law, was mailed to every registered physician in the State with the exception of those in three counties, from the Superior Court Clerks of which no replies have been received to letters requesting a list of the registered physicians in their counties.

Section 9 says: "Inland quarantine shall be under the control of the County Superintendent, who shall see that diseases especially dangerous to the public health, viz., small-pox, diphtheria, scarlet fever, yellow fever, typhus fever and cholera, are properly quarantined and isolated within twenty-four hours after the case is brought to his knowledge, etc."

Section 10 says: "When a householder knows that a person within his family is sick of either of the diseases enumerated in section 9 he shall immediately give notice thereof to the health officer or mayor if he resides in a city or incorporated town, otherwise to the County Superintendent of Health; and section 11 requires the attending physician to give the same notice as soon as he makes a diagnosis of one of these diseases."

To successfully carry out the law in relation to contagious diseases a cordial co-operation between the County Superintendent or local health officer, the attending physician and the householder, is necessary.

These words are penned in the hope of aiding as far as possible in bringing about this necessary co-operation by suggesting how it may be best managed practically. The County Superintendent or municipal medical health officer is responsible and he cannot evade his responsibility, and whatever may be the method used in performing this duty that fact must not be lost sight of. It is manifestly impracticable to expect a County Superintendent in a large county on an entirely inadequate salary to personally superintend the quarantining of the patients and the disinfection of the premises and articles used after death or recovery in every case of contagious disease. Our health officers *ought* to be paid enough to justify them in giving their whole time to sanitary work, some of us think, but the people of our State certainly do not yet take that view of it, and until they do we must do the best we can with what they give us. The idea has been suggested that some physicians might look upon the appearance of the Superintendent of Health in the sanitary management of their cases as an intrusion and that trouble might arise in consequence. While there could be no just ground for such a feeling if the health officer confined himself to his duties and the attending physician were as courteous as we have right to expect, still it is always best to avoid anything that might lead to unnecessary friction. To that end it seems to the Secretary of the State Board that the best plan would be this: Let the County Superintendent or municipal medical health officer obtain from all registered physicians, who are themselves members of the County Boards of Health, their promise (preferably in writing to prevent any misunderstanding afterwards) to carry out the instructions for quarantine and disinfection as required by law. When notified of the occurrence of a case of the diseases mentioned, in the practice of any one who has made this promise, let him promptly send him a copy of the instructions together with a proper placard. At the same time he should send to the householder also a copy of the instructions with a note calling attention to the requirements of the law in such cases, and stating that he had committed its execution to the attending physician who had given his promise to see it carried out. The attending physician, remembering the responsibility resting upon the conscience of the health officer, should, immediately upon the completion of the disinfection, certify to him that the requirements of the law had been met. The health officer should of course personally look into any suspicious cases having no physician, and if contagious disease be found, see himself that the required precautions are taken.

While the above is not the ideal method of applying the law, it is as good, taking all the facts as they actually exist into consideration, as any which occurs to the writer that is at all practicable.

Twenty-five placards each for diphtheria and scarlet fever, and two each for the other four diseases, together with fifty copies of the Instructions for Quarantine and Disinfection, have been sent to every County Superintendent and municipal medical health officer. Upon notification to the Secretary of further need a new supply will be forwarded. The Secretary would also be glad to furnish the same to individual physicians in counties having no Superintendent, and he hopes that immediately upon the occurrence of a case of either of the diseases mentioned in the practice of any one living in such counties notice will be sent to him at once that he may send the "Instructions" and placards.

LOCAL BOARDS OF HEALTH.

The proverb, "What is everybody's business is nobody's business," is as true in sanitation as in every other branch of human effort. Looked at from the stand-point of a man's duty to himself and to his neighbor, the observance of the laws of hygiene ought to be the particular business of every individual. But the obligation is not recognized, or, if it is, it is not met. And so it becomes necessary to provide some means to force the people, as far as possible, to perform their duty in this respect, as in so many others. This force to be effective must be handy and easily and promptly applied. In consequence, a local Board of Health whose special business it is to look after these matters is practically a necessity to effectual work in any community. In the hope of bringing about the establishment of such Boards and the observance of approved methods by them, the Secretary has sent out the following letters, which may be of interest to our readers. They explain themselves. Copies of the ordinance, blanks, etc., will be gladly sent to any one interested enough to write for them:

"NORTH CAROLINA BOARD OF HEALTH,
"RALEIGH, June 9, 1893.

"*The Honorable Mayor and Board of..............*

"GENTLEMEN:—I send herewith a copy of the Act Relating to the Board of Health (Chapter 214, Laws of 1893), a model health ordinance, based chiefly on the admirable one issued by the Pennsylvania Board of Health, and various blanks, which explain themselves. I hope that you will adopt and enforce them, thereby materially advancing the cause of public health and *pari passu* the prosperity of your town. The ordinance may strike you as being rather voluminons, but a careful consideration of the same will, I think, show the reasonableness and importance of each section. Still, if deemed necessary, it can be modified to suit the particular conditions of your town, though I would be glad to have it adopted as it stands in order to secure a uniform system in every town in the State.

"In cities and towns where people are more or less crowded together and the danger of contamination of air and drinking water and the spread of communicable diseases from person to person is in consequence greatly increased, the practical application of sanitary laws is especially important. The collection of vital statistics, particularly those relating to the cause of death, should be carefully looked to in order to ascertain those most prevalent, with a view to taking special precautions against them in the future. It is also of great importance from a material point of view. One of the first inquiries made by intending immigrants is in regard to the healthfulness of their contemplated destination, and that information would be sought for at this office. To give an opinion I must be assured of their *completeness* and *accuracy*. Those two essentials cannot be obtained unless the method recommended is faithfully carried ont, viz.: The positive refusal to allow the body of any one dying in the town to be buried or removed without a permit from a designated official, based upon a properly filled out and signed death certificate giving the cause of death; or some other method equally as reliable. The healthfulness of our State is one of its greatest attractions, and the only way to demonstrate it to strangers in these days of scientific accuracy is by means of reliable vital statistics. In our present stage of sanitary development these statistics can only be obtained from our cities and towns, and I trust you will help your own immediate home and, at the the same time, aid me in showing to the world our advantages in this most important item of health.

"Any further assistance in my power would be most gladly rendered by, Yours very respectfully,

"RICH'D H. LEWIS, M. D.,
"*Secretary.*

The following letter was sent to every physician in the towns referred to:

"North Carolina Board of Health,
"Office of the Secretary,
"Raleigh, June 12, 1893.

"My dear Doctor:—The State Board of Health is very anxious to have established in as many of our cities and towns as possible Local Boards of Health for the twofold purpose of more effectively preventing disease and securing reliable vital statistics. To this end I have prepared and sent to the Mayor of every town in the State of more than five hundred inhabitants and to all county-seats of less population a model ordinance in which is set forth, in addition to numerous sections relating to health preservation, the machinery necessary to the formation and operation of Local Boards; also a sample death certificate, burial certificate, birth certificate and instructions with sample blanks for sanitary inspection, which you can see at the Mayor's office.

"If you have no local Board of Health will you not confer with your professional brethren and the municipal authorities and make an earnest effort to have one established at once?

"If you already have one will you not compare the methods in use with those suggested that the best may be employed? If those suggested, particularly those relating to the collection of vital statistics, more especially the death-rate, are considered equally as good as those already in use, and it be agreeable to the authorities, I would be very glad to have the former substituted for the latter in order to the establishment of a uniform system throughout the State.

"It is superfluous, if not insulting, in this day to argue to any well-informed physician the value and importance of sanitary regulations properly enforced, and the value of reliable vital statistics, from both a scientific and a material point of view. So I assume that you are interested in the subject and hope you will lend a hand in advancing the good work. Very truly yours,

"RICH'D H. LEWIS, M. D.,
"*Secretary.*"

TYPHOID FEVER.

The presence of typhoid fever in twenty-three counties reporting for June and private advices since the 1st instant as to its outbreak in two others, and the further fact that in at least one instance it has proven unusually malignant, suggest the advisability of calling the attention of all physicians as well as of all other readers in this State to section 21 of the Act Relating to the Board of Health. It reads as follows:

"Sec. 21. Any householder in whose family there is to his knowledge a person sick of cholera or typhoid fever who shall permit the bowel discharges of such sick person to be emptied without first having disinfected them according to the instructions to be obtained from the attending physician or the County Superintendent of Health shall be guilty of a misdemeanor, and upon conviction shall be fined not less than two nor more than twenty-five dollars, or imprisoned not less than ten nor more than thirty days. And in cases where such undisinfected discharges are emptied on the water-shed of any stream or pond furnishing the source of water supply of any public institution, city or town the penalty shall be a fine of not less than twenty-five nor more than fifty dollars, or imprisonment for not more than thirty days. And any physician attending a case of cholera or typhoid fever who refuses or neglects to give the proper instructions for such disinfection as soon as the diagnosis is made shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than ten nor more than fifty dollars."

The meaning of this section of the law is so plain that "he who runs may read."

The very great importance of its conscientious observance by all householders and physicians is self-evident to any one who at all keeps up with the times in sanitary matters. Its reasonableness cannot be disputed, for the directions for properly disinfecting these discharges are plainly given in the Instructions for Quarantine and Disinfection prepared by the Secretary in obedience to section 9 of the act and sent to every registered physician in the State except those in three counties whose names could not be obtained. The disinfectants recommended are cheap and handy, and can be thoroughly used with very little trouble.

It is to be noted that not only physicians who refuse (it is difficult to imagine a physician worthy of the name refusing upon request to give advice that will prevent the spread of a dangerous disease) but those also who *neglect* to give the proper instructions for such disinfection are guilty of a misdemeanor and subject to fine. Sanitary sins are generally sins of omission and unfortunately like such sins in other directions are extremely common. It is earnestly hoped that all physicians will show themselves no less law-abiding than other good citizens, and will do their full duty to their neighbors as their State demands of them. By so doing they would be the means of saving many lives directly and would at the same time do more to educate the people in the principles of enlightened sanitation than any other influence that could be brought to bear on them.

TYPHOID FEVER AGAIN.

Although faint mutterings of cholera to the north of us and a somewhat louder growl from yellow fever to the south of us are heard, typhoid fever is unusually prevalent within our own borders, and its prevention remains with us in North Carolina the great sanitary question of the day. When we realize that the number of deaths annually from typhoid in this State is estimated at one thousand it is easy to understand that it has slain its thousands where both the other diseases combined have claimed their tens, or less. And it will continue to do so, probably in an increasing ratio, unless our people can be aroused to the importance of the strict observance of the proper sanitary precautions. As a practical sanitary question, therefore, for the whole State, the prevention of typhoid fever is a very much more serious one than that of either of the other much more dreaded diseases. But it is extremely difficult to get the people to realize and act upon it. Such a realization on their part we regard as of so much moment that at the risk of proving tedious we bring up the subject again for the purpose of urging County Superintendents and all other physicians to bestir themselves to promote a more enlightened public sentiment on this subject especially, not omitting other matters pertaining to preventive medicine. Much to our regret and discouragement, we have been compelled to admit that many of our physicians are not as careful as they might be in impressing upon the nurses and friends of their patients the danger of spreading the disease to themselves and others by using the same drinking utensils as the patient, by continuing to use the same water supply unboiled, by washing the undisinfected soiled linen near the well, and, worst of all, by disposing of the bowel discharges, in any manner, without thorough disinfection by reliable disinfectants of the same. But even when the matter is not overlooked it often happens that the directions given are so general and vague as to be of no practical value. Again, it frequently occurs that the family having received the proper instructions fail to carry them out—sometimes not at all, but more often inadequately.

Most people are reasonable and tractable, particularly in their relations with one in whom they usually have so much confidence as their family physician. If they understand the reasons for a certain course of action, and they are good reasons, they are very apt to follow that course. The generality are entirely ignorant of sanitation, and the attending physician, therefore, should take some pains to explain to them how the fever is transmitted through the drinking water contaminated by germs from the undisinfected discharges of some previous case, clinching the matter by giving illustrations, which can easily be done from medical literature, if not from actual personal experience. A want of faith is at the bottom of the whole trouble. Convince their judgments and the proper action on their part will follow.

In conclusion, a word as to the disinfectants to be used. Those recommended in the Instructions for Quarantine and Disinfection, a copy of which has been mailed to every registered physician in the State, except those in three counties whose addresses could not be obtained, were given after very careful consideration and due consultation of the best authorities. It is advised that they only be used, as they are reliable, cheap and convenient. Beware of ready-made, patent or proprietary disinfectants; they cannot be depended upon as germ killers, though they may be very good deodorants.

SANITARY PROGRESS IN 1893.

With this issue of the *Bulletin* the edition will be increased from eight to twelve hundred copies, and it will hereafter be sent to every member of the State Medical Society as well as to every other person interested enough in it to ask for it. It is to be regretted that at present the means at the disposal of the Board of Health do not permit its being sent to every physician in the State. Although it is well known that there are many excellent men who have never, for various and doubtless good reasons, connected themselves with that organization, the fact that a physician is a member of the State Society is presumptive evidence that he is wide awake and interested in his profession. No one who really keeps abreast with medical progress can be indifferent to the claims of preventive medicine, which has made such rapid strides in late years. The Board of Health realizes that the success of the cause they have in charge depends upon the interested support of the medical profession. Without that support its most earnest efforts must prove for the most part fruitless. It is in the hope of exciting a more active interest on the part of the, generally speaking, representative medical men throughout the State that this step is taken. The strange indifference, amounting in some cases almost to actual hostility, to the claims of sanitation shown unfortunately by many of our physicians—men from whom better things might be expected—is the most discouraging obstacle we have to face. There is not in the health laws of the State a single claim made upon its medical citizens which a decent regard for humanity not only justifies but demands—as a careful perusal of the same will, we think, prove to any reasonable man. It is therefore hoped and believed that by bringing these matters frequently to their attention through the monthly visits of the *Bulletin* greater interest in the cause in general and a more loyal support of the law in particular will be excited among our leading physicians. This being accomplished, it is not unreasonable to anticipate that the influence of their example will gradually but surely bring about a similar state of affairs among their professional associates and the people at large. While all that has been written is only too true, we have, nevertheless, made gratifying progress in the past twelve months, as a comparison of the present number of the *Bulletin* with that for November, 1892, will show. At that time out of a total of ninety-six counties only sixty-four had Superintendents of Health, of which number only forty-three reported, while this month the number of Superintendents recorded is eighty-eight, of whom *not one failed to report.* This is very encouraging. We are further encouraged by the fact that two of our principal towns, Salisbury and Oxford, have adopted the model health ordinance sent out by the Board during the summer, which, if enforced, will insure accurate and reliable vital statistics—something greatly to be desired. But we will consider this subject at length in a subsequent issue.

By the time this reaches our readers the new year will be impending. Among the good resolutions to be made on its first day there will be numbered, we trust, one on the part of every medical reader at least to do more than ever before for the noble cause of preventive medicine.

SMALL-POX.

Small-pox is, we regret to say, spreading rapidly over the United States. Winter is the season most favorable to its diffusion. The rapid and easy communication between all parts of the country renders its introduction more than likely. The immense number of unvaccinated persons in our State furnishes a most fruitful and inviting field for the work of this most dreadful disease. All our medical readers, Superintendents of Health especially, are urged to be on the alert, and to immediately and strictly quarantine every case, including those that are suspicious, vaccinating promptly not only those who may have been exposed, but every one whom the fright may have induced to seek that protection. The name and address of a reliable dealer in vaccine will be gladly furnished if desired.

DEATH OF DR. SUMMERELL.

It is with heartfelt sorrow that we record the death from double pneumonia, consequent upon an attack of the grip, of Dr. J. J. Summerell, of Salisbury, Superintendent of Health of Rowan county. On the afternoon of Sunday, the 17th inst., at the age of seventy-four, this faithful physician, sterling citizen and Christian gentleman, surrounded by his children and in possession of the respect and affection of his neighbors, after a long life of usefulness and honor, passed to his reward. The State, the medical profession, and especially the cause of sanitation in North Carolina, have suffered a serious loss. While the oldest, he was, nevertheless, one of the most active and enterprising Superintendents in the State. We shall miss him, personally as well as officially.

VACCINATION.

In a recent letter from one of the largest practitioners in the State, living in a town of over five thousand inhabitants, situated on one of the main lines of travel, this startling sentence occurs: "In making inquiries I find that there are scarcely a dozen children in the whole town who have ever been vaccinated." While we were painfully aware of the fact that the number of the unvaccinated was alarming, we had no idea the state of affairs was so bad as shown by the above. This is an extremely serious matter, as all must admit, and it is becoming more and more serious every day. In our last issue we called attention to the rapid spread of small-pox over the United States and sounded a note of warning. Since that time the disease has made its appearance in our own State—in Cherokee; but thanks to the prompt and vigorous action of the County Superintendent of Health looking to the quarantining of the patient he did not abide with us long. Rather than be quarantined he left the State, thereby demonstrating in a very practical and satisfactory manner the value to the community of an organized health department with an alert health officer. Most fortunately also he came in contact with none except those who were protected by a previous attack of the disease, and we have good reason therefore to hope that he will not leave a trail behind him. There is no reason why a similar case should not crop out at any other point in the State, particularly on the main lines of travel, which are now more than commonly infested with tramps. It is most unlikely to happen again that every one exposed is protected, and if not there is no telling, in view of the great number of unvaccinated persons to be found everywhere in the State, what a terrible scourge might then and there be originated. The danger is a real one, but how to get the people to realize it and to avail themselves of the protection so easily obtainable is the question, and a most difficult question it is to answer. Most persons not aquainted with the temper of our people would say at once make vaccination compulsory. That sounds well, but it would be *vox et preterea nihil.* In the first place, in the opinion of the writer, our Legislature could not be induced to enact such a law; and if it could the law would, unsupported by public sentiment, be a dead letter. As to what public sentiment on this subject is the following will illustrate: At the conjoint session of the State Board of Health with the State Medical Society in Wilmington in 1892 one of our County Superintendents reported that going to a public school-house to vaccinate the children, according to a previous appointment, he found the house shut up and the entire school, teacher and all, taken to the woods. Again, more recently, an outbreak of the small-pox occurred in an adjoining State about fifty or sixty miles from one of our progressive towns. The Town Commissioners discussed the advisability of passing an ordinance making vaccination compulsory, whereupon some of the best citizens promptly gave notice that they would sell out and leave the town before they would submit to it. Comment is unnecessary.

We would like to discuss this grave matter at length, but our want of space forbids. Suffice it to say that after a very careful consideration of the subject we have come to the conclusion that nothing can practically be accomplished in the way of vaccinating the people except under the influence of the scare resulting from the presence in the community or in very close proximity thereto of a case of small-pox. It is therefore earnestly hoped that whenever such a state of affairs does happen to occur the health officers and physicians generally will grasp the situation and "work it for all it's worth."

In conclusion, we wish to call particular attention to section 11 of the law, which requires the attending physician to immediately give notice to the local authorities of the occurrence of a case of small-pox, and the latter to immediately communicate the same by mail or telegraph to the Secretary of the State Board of Health. The location of the case, the origin of the disease and the measures taken to prevent its spread should always be given in this communication.

P. S.—After the above was sent to the printer a report was received from the Superintendent of Anson county of the existence in Wadesboro of a case of varioloid in the person of a horse drover from Virginia, near Bristol. He at the same time reported that the precautions required by law had been promptly taken.

VITAL STATISTICS.

One of the most important functions of a sanitary bureau is the collection of vital statistics. Section six of our law says:

"Monthly returns of vital statistics, upon a plan to be made by the State Board of Health, or their Secretary acting under their instructions, shall be made by the County Superintendent to the Secretary of the State Board."

The plan devised by the late Secretary, the lamented Dr. Wood, and still in vogue as the best available, is not calculated to secure complete and accurate statistics, but merely a general idea of the prevalence of particular diseases, especially those of a communicable character, in the counties, and the number and causes of death in the cities and towns. Indeed, the conditions with us are such—an extremely conservative and rather sparsely settled rural population in the main—that obtaining reliable statistics from the State at large is simply out of the question at present, and we fear will be for very many years to come. And yet it is of peculiar importance to our State, inasmuch as immigration is greatly desired, that we should have accurate and reliable statistics, especially in mortuary statistics. We say accurate and reliable, for when they lack those qualities to any appreciable extent they are worthless. The practical question is, how can they be obtained? The answer is, from the cities and towns. While such statistics would not be as valuable as those collected from the whole State, it is the best that can be done, and they would furnish excellent samples of the health conditions in the different sections of the State and an admirable basis for comparison with similar communities in other States and countries. But even in cities and towns it is no easy matter to secure full and reliable mortuary statistics. It cannot be done, in the opinion of the writer, except under the strict and vigilant enforcement of a stringent ordinance imposing a decided penalty for the burial or removal from the corporate limits of a dead body except upon a burial permit issued by a designated official, based upon a death certificate, giving, chief among other things, the cause of death, signed by the attending physician, or, in cases where there was no attending physician, by the nearest friend, and sworn to by him before a magistrate. The authorities should impress this ordinance particularly upon the undertakers in such a manner as to effectually prevent their undertaking the preparations for burial until the burial permit is produced. Something less than a year ago we sent to every town in the State having five hundred or more inhabitants, and to all county-seats of less population, a model ordinance, with sample blanks, in which the regulations suggested above were set forth, in the hope that it might be generally adopted and mortuary statistics collected in every place on the same plan. While only two towns have formally adopted the ordinance as a whole, a number have it essentially, and the statistics sent in we believe to be generally reliable. But we cannot help feeling when we note a death-rate very much smaller in one town than in another of about the same sanitary conditions that the former either has an imperfect ordinance or does not enforce a good one. We are not willing to admit, of course, that any municipality would deliberately "fudge," as we used to say in marbles, on its sisters

We have brought forward this subject because of its importance and in the hope that those of our readers living in cities and towns will interest themselves in the matter sufficiently to inquire as to the ordinance on the subject and as to the enforcement of the same. The display of such an interest on the part of the medical men of any city or town would surely have its effect upon the authorities and make for the perfecting of the returns.

MALARIA AND DRINKING WATER.

If we have a sanitary "fad" it is the influence of the drinking water in the production of malarial diseases. It has always possessed a peculiar interest for us, originated possibly by the plasmodia imbibed in childhood from the "old oaken bucket" that hung in the shallow surface well, the remembrance of which is so dear to our heart. But our first conscious interest in the subject was brought about by hearing, many years ago, one we loved and trusted, a member of one of the two families referred to, make this statement: There were two families, composed each of father and mother and seven children, friends and next-door neighbors, in one of our eastern towns. One family drank from what was regarded with pride as "the best well in town"; the other of rain-water caught in wooden tanks. The members of the first family were constantly sick with malarial disease of one kind or another. Those of the second never had even a chill.

We have heard and read of many similar instances since, and while many writers on malaria ignore the drinking water as a channel of introduction of the malarial poison into the system, the conviction has been growing upon us that, if not the chief, it is one of the principal avenues of ingress. We desire and intend, with the assistance of those who can help us by giving us the necessary information, to demonstrate this fact upon homespun evidence. To that end we propose to send to every physician living in the malarious sections of the State the subjoined circular letter, and we earnestly hope that every one who can give us any pertinent information of his own knowledge, or send us the names of any of his acquaintances who have had experience in this matter, will do so promptly. If we succeed in making out a satisfactory case, the evidence will be laid before the people most interested in a form which will, we hope, make sufficient impression upon them to bring about some practical result of real value:

"Dear Doctor:—The evidence that malarial diseases are introduced into the system, in many if not most instances through the medium of the drinking water is, to my mind, conclusive. The water containing the germs or plasmodia is surface or superficial soil water. Those living in malarial districts who confine themselves to water from cisterns or wells, driven or bored beneath the stratum of marl or impervious clay—in other words, beyond the water which soaks down from the surface—are to a large extent free from attacks. If the people of our eastern counties could be generally convinced of this fact and thereby induced to act upon it, the health conditions of that really fine section would be revolutionized for the better. To bring this about is the object of the Board of Health. In order to do this facts must be presented to them in the concrete—not by illustrations from "Asia and Spasia and t'other side o' Hillsborough," so to speak, but by instances from among their own neighbors. I write to ask you if you know any facts bearing on this subject, and, if so, that you write them to me in detail at your earliest convenience. Give the name and post-office of the head of the family having the experience. If not personally familiar with the facts send me the name and address, that I may write him direct.

"Your kind and prompt attention will greatly oblige,

"Yours truly,

"RICH'D H. LEWIS,

"*Secretary.*"

THE PREVENTION OF BLINDNESS.

In addition to the adoption of the resolutions in regard to the better education of our physicians in hygiene published in our last issue action was also taken by the conjoint session of the State Board of Health and the State Medical Society at its second annual meeting looking to the lessening of blindness, a calamity second only to death itself.

While the estimates vary we think it safe to say that *ophthalmia neonatorum* is the chief cause of hopeless blindness. Quite a number of years ago in a paper on this subject of the purulent conjunctivitis of the newborn we attempted to show in our introductory remarks that blindness from this cause as well as congenital blindness was a peculiarly sad affliction, more to be deplored than blindness coming on later in life. We cannot lay our hands upon it, but we remember the main point in our argument is this: A person who has never consciously seen or who has no recollection of seeing can never have the mental concepts that can come only through the eye; he can never conceive the idea of color, and those of form and distance must be very inadequate. This being true, it is easy to understand how seriously handicapped such a person would be in his mental operations, particularly those involving the exercise of the imagination. If, however, he has enjoyed even for a season the inestimable blessing of sight the pages of memory will have been illuminated with innumerable pictures that can never be entirely effaced; he will be in possession of accurate and complete conceptions of color, form and space, and thereby enabled to apprehend in their completeness the ideas transmitted through the language of others. Therefore, having these beautiful conceptions, he can in the kaleidoscope of the imagination evolve an infinite number of pictures and enjoy more fully the pleasures of that faculty. So if there can be degrees in such a misfortune, so dreadful at its best, we feel that the class under consideration are most to be pitied. But it requires no argument to excite the sympathy for these stricken little ones of our readers or to enlist their co-operation in any movement for saving others from the same affliction. Most of them have doubtless seen such cases, and no words can equal in eloquence the mute appeal of those sightless and disfigured orbs. The practical question with us is, What can we do to prevent in future such cases of blindness? *Ophthalmia neonatorum* itself is generally a preventable disease, but even when the disease has become established its serious consequences can almost always be averted by prompt recognition of its presence and proper management of the treatment. All well-educated physicians are familiar with the disease, its treatment and its dangers; they therefore require no instructions on these points. It is the midwives and monthly nurses that we must reach and compel them if possible to call in a qualified physician immediately upon the appearance of redness or swelling of the eyes within the first two weeks of the life of any infant under their charge. Legislation requiring such notification under penalty for failure has been enacted by the States of New York, Maine and Rhode Island. At the meeting of the American Medical Association in 1893 a committee was appointed by the Section of Opthalmology, Dr. Lucien Howe, of Buffalo, chairman, to urge such legislation. The conjoint session adopted the following resolutions:

"*Resolved*, That it is the sense of this conjoint session of the State Board of Health and the State Medical Society that legislation tending to lessen blindness from this disease (*ophthalmia neonatorum*), similar to that already enacted in a number of the other States, is desirable.

"*Resolved*, That the Committee on Legislation of the Medical Society be requested to use their best endeavor, if in their judgment after the assembling of the Legislature in 1895 it be wise to agitate the subject, to secure the enactment of such a law."

We are not sanguine enough to believe that any law on this subject can be practically enforced in the present state of public opinion, but we believe that its presence on the statute book and distribution throughout the State will do good, will enlighten the people and save some innocent little ones from a life of hopeless darkness.

PREVENTION OF TUBERCULOSIS.

As announced in the last *Bulletin* the campaign which the Board proposes to conduct against the spread of tuberculosis in North Carolina was opened by the admirable paper of Dr. S. Westray Battle, of Asheville, read at the recent Salisbury Health Conference. It will appear in the forthcoming *North Carolina Medical Journal* and then be distributed in pamphlet form to every physician and many citizens of other callings throughout the State. That is a good big gun and we believe it will do much execution, but in such a war as this—against an enemy so numerous and so strongly entrenched—every death-dealing agency must be brought into play. The medical men can operate the artillery, but the main question is how to get the best repeating-rifles into the hands of the rank and file—the people.

The Secretary is *ex officio* the leader in this fight, but he feels that every physician is. under the principle of *noblesse oblige*, one of his brother officers. He has cogitated deeply on the subject of how to practically reach the people, and while he has several schemes in mind he remains of the same opinion he has long entertained—that it is through the family physician it can best be done. But how to enlist the family physician? That is the question. As mentioned before in these columns the most disheartening fact which confronts the Board in its work for humanity is the coldness and indifference of so many physicians of whom better things could justly be expected. If our natural allies do not stand by us what are we to do? But we feel a special interest in this matter other than that of the health officer. Our pride in our North Carolina profession is involved. For many years, as is probably known to most of our readers, we have earnestly endeavored by voice and pen and whatever personal influence we might have with members of the Legislature to promote the elevation and advancement of the profession by raising the standard of medical education. While our people generally are sometimes referred to by outsiders as "slow" we have rejoiced at the meetings of our State Society to hear distinguished medical visitors from other States and the largest cities say that it was equal to the best and superior to most similar organizations known to them. It may be that, like the crow that thought his nestling the whitest, we exaggerate the importance of hygiene, but we believe that every thinking physician who reads will admit that it is the coming branch of medicine. We would be mortified if our men were "not in the swim." Gentlemen, we must "keep up with the procession."

What we desire of the family physician is that he explain not only to his phthisical patients, but to the uninfected of his *clientele* as well, the communicability of the disease and the way to prevent its spread. He is doubtless already well informed on this subject himself, but we would be only too glad to forward matter for distribution among his patients. We would be particularly glad to have him report directly to this office every case of tuberculosis as soon as the diagnosis is made that we may forward the proper instructions and thereby save him trouble. In some States this is now obligatory. While voluntary with us we hope that this duty will be none the less thoroughly performed.

Think of four thousand persons dying in our State every year of consumption; lay that fact to heart and lend a willing hand in the effort to check such slaughter.

HYGIENE AND THE MEDICAL COLLEGES.

REMARKS BY THE SECRETARY AT THE RECENT MEETING IN WASHINGTON OF THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

Mr. President and Gentlemen:

When I received notice from the Secretary of this body that I had been appointed to open the discussion on the question, "Should medical colleges be required to devote an adequate time to instruction in hygiene, and exact of candidates for the degree of Doctor of Medicine an examination in this branch of medical education?", I was sincerely surprised. At the same time as a patriotic North Carolinian I was gratified at the reason assigned for the selection of so humble an instrument, to-wit, that our State was a pioneer in such matters. I must, however, disclaim any particular credit for North Carolina so far as making any special effort for better education in hygiene is concerned. If I am rightly informed, to Illinois, in the person of our late friend and associate, Dr. Rauch, that honor chiefly belongs. But I am constrained to confess that we are proud of the fact, which is well known, that in the matter of elevating the standard of general medical education, by the enactment of a practicable license law, North Carolina was *the* pioneer, and that she continues to march in the front rank.

The subject before us, Mr. President, is, by odds, the most important on the programme. Every other question proposed represents some particular part of the superstructure of hygiene, while this is the very bed-rock upon which applied sanitation rests—and theoretical or unapplied sanitation is of no practical value. The fact is, gentlemen, that the answer to this question is so plain and so irresistibly self-evident that I feel embarrassed lest in arguing in its support I insult your intelligence. You will, therefore, please pardon me if I appear to be elementary.

It is a well-established fact, which no man of experience will deny, that no law, unless supported by public opinion, can be enforced—certainly in this free country of ours. The opinions of the people on any subject are controlled by the attitude of trusted leaders in whose knowledge of that subject they believe. No class of men have the confidence of the masses of the people, in matters generally, but especially in all relating to medicine, to the same degree as the family physicians of our land. Disease being a departure from health, the proper study of disease implies a study of the laws of health. Every man of common sense assumes that his physician is familiar with these laws. If he hears nothing of them from him he takes it for granted that they are of no special importance and, consequently, instruction from others of as little, or less, authority in his opinion makes no impression. It is through the medical adviser, therefore, chiefly, that a public opinion in support of the practical application and enforcement of the laws of hygiene must be built up. But it is a lamentable fact that the attitude of the profession generally to this most important subject is one of cold indifference. Indeed, I am informed that it sometimes happens in individual cases—rare let us hope for the honor of our profession—that the physician, in order to conciliate a paying patron, will actually countenance a deliberate violation of the plainest rules for the prevention of the spread of contagious diseases—and for no better reason than that his client is not willing to be put to a little temporary inconvenience for the sake of the health, and lives often, of his neighbors.

Now, what is the explanation of this state of affairs? In my humble judgment it is attributable, mainly, to a want of proper instruction during the formative period in their medical lives. "Train up a child in the way he should go and when he is old he will not depart from it" is a proverb of the wisest of men which applies with equal force to the education of physicians. The neglect of this early training is, doubtless, the chief cause of the indifference to the claims of sanitary science of which we complain in so many physicians now in the field.

If hygiene be given a dignified position in the curriculum and its great importance be properly emphasized, there can be no question as to the good it would accomplish in the coming generation. It would not only redound greatly to the welfare of the people, but it would have an elevating effect upon the profession itself, by impressing the philanthropic aspect of the calling which we are in the habit of referring to as "noble"—improperly, we must admit, if we take the merely commercial view of it—if we value it simply for the money there is in it.

I regret that I am not informed as to the extent to which hygiene is taught in all our medical colleges, but from what I know I feel that I am safe in saying that, outside of a very few of the best, the subject is practically ignored. That this condition of affairs should not be allowed to continue, if it can be prevented, needs no further argument. As guardians of the public health it is our duty to see that it is done. We have it in our power to do it. In many of the States the State Board of Health and the Medical Examining Board are one and the same. If those Boards alone will unite in demanding of the medical colleges sufficient instruction in hygiene, and will *require of every applicant for license satisfactory evidence that he has received and profited by it*, the matter will be settled. Of course the desired result would be obtained more quickly and more certainly by an advance all along the line. In those States where the two Boards referred to are separate and independent of one another the Board of Health should exert itself to interest the Board of Examiners, particularly, and the profession, generally, in the subject. As bearing upon this point, and as a fitting conclusion to what I have to say, I will take the liberty of quoting, what some of you may have seen, an editorial entitled "Hygiene in Medical Education," which appeared in the June number of our *Bulletin* and which shows what action has been taken in North Carolina. The reader is respectfully referred to the same.

HYGIENE IN MEDICAL EDUCATION.

At the recent conjoint session of the State Board of Health and the State Medical Society the following resolutions were unanimously adopted:

"*Resolved*, That the medical colleges of the country be requested to give to the subject of hygiene sufficient time for thorough instruction of their students on that subject—not less than two lectures a week.*

"*Resolved further*, That our Board of Medical Examiners are hereby requested to require of applicants for license the same preparation on this as on the other branches of medicine named in the Medical Practice Act."

Resolutions similar to these were adopted not long since by the State Board of Health of Ohio, and perhaps other Boards of Health have done the same thing, but so far as we know this is the first instance in which the organized medical profession of a State has joined in such action. It is significant of the progressive spirit that animates the profession in North Carolina. The importance of having the medical colleges pay more attention to hygiene than most of them do is apparent. Every physician who does his whole duty is necessarily a health officer. His noble mission is to save from sickness and death. In no way can he accomplish so much as by the inculcation and moral enforcement of true sanitary principles. No matter how well organized a health department may be, nor how competent the legal health officer, satisfactory results in preventive medicine cannot be obtained without the cordial co-operation of the attending physician. If this is true, and we do not suppose any one will controvert it, the fact is a lamentable one that so many of us manifest such a degree of indifference to practical hygiene. As we have remarked in a former number of the *Bulletin*, this fact is inexplicable to us, or has been; but we think we see light. "As the twig is bent the tree's inclined." In our medical childhood, while under tutors and governors, we were not sufficiently instructed in hygiene, our minds were not inclined in that direction. This most important subject was, in the medical education of many of us, entirely ignored or belittled by the meagre attention it received. And we believe this is the principal reason that so many physicians admirably equipped in every other respect are so strangely indifferent to the claims of sanitation.

If our Board of Medical Examiners accedes to the request made in the second resolution (and we believe it will for the reason that it is composed of men who represent the progressive element in the Society), we shall feel hopeful of a goodly yield of fruit from the first resolution.

None of our readers not thoroughly familiar with matters medical in North Carolina can fully appreciate what a power the Board of Medical Examiners has been and is in promoting higher medical education. It has, with its absolute independence under our admirable law, and its high standard of 80 per cent., with the help particularly of the Virginia Board since its establishment, to express it baldly, forced the colleges chiefly patronized by North Carolina students to do better work. We know that some years before the Virginia license law was passed one of these institutions informed its students from North Carolina that they would have to stand a more rigid examination than the other members of the class because of the State examination that awaited them. If our Board and those of other States join in this movement it will not be many years before preventive medicine will be better taught in our medical colleges, and our physicians, having a more thorough knowledge of the subject and a clearer idea of its importance, will give it in their daily practice the attention it certainly deserves.

---

*While not so stated, we feel sure that two lectures during the last year of the course would meet the requirements.

REPORT OF TREASURER FOR TWO YEARS ENDING DECEMBER 31, 1894.

1893.		Expenditures.	
Jan.	4.	One copy Laws of Public Health and Safety	$ 5 25
	5.	Postage on December *Bulletin*, third-class, 8 cents per pound	2 24
	6.	Stamps	10 00
	14.	Repairs to typewriter	2 50
	20.	Sundry telegrams	1 63
	25.	Stenographer for Health Conference at Raleigh	22 50
	28.	Paid for extra typewriting	3 50
	28.	J. A. Hodges, *per diem* and expenses Health Conference at Raleigh on 24th inst.	16 25
Feb.	1.	F. P. Venable, *per diem* and expenses Health Conference	20 60
	2.	Salary of Secretary for January	100 00
	2.	Cyclostyle supplies	1 90
	3.	Stamps	10 00
	4.	Express on cyclostyle supplies	40
	11.	Subscription to eight copies *Sanitarian* for members of Board	28 00
	25.	One bottle cyclostyle ink	1 00
		Telegram	25
		Express on publications of Board to World's Fair	65
March	1.	Salary of Secretary for February	100 00
	4.	J. H. Tucker, *per diem* and expenses Health Conference	11 45
	10.	Postage on *Bulletin*	2 40
		Stamps for mailing Biennial Reports	10 00
	13.	Stamps for mailing Biennial Reports	5 00
		Stamps for general purposes	10 00
	20.	H. B. Baker, Treasurer, assessment by National Conference State Boards of Health for inspection of quarantine stations on Atlantic Seaboard	30 00
April	3.	Salary of Secretary for March	83 33
		One typewriter cabinet	12 75
	14.	G. G. Thomas, *per diem* and expenses January Health Conference	14 30
	15.	R. H. Lewis, expenses Conference of State Boards of Health at New York, beginning April 5th	56 90
	17.	H. T. Bahnson, expenses to above Conference	61 70

April	29.	H. T. Bahnson, *per diem* and expenses visit to D. & D. School at Morganton at request of Chairman of Board of Directors for advice on water supply	$ 17 15
May	1.	Salary of Secretary for April	83 33
	2.	Stamps, mailing a copy of health law and of quarantine and disinfection instructions to every registered physician	15 00
	10.	Freight on typewriter cabinet	1 52
	15.	F. P. Venable, *per diem* and expenses annual meeting at Raleigh	18 75
		H. T. Bahnson, *per diem* and expenses annual meeting at Raleigh	25 30
		J. C. Chase, *per diem* and expenses annual meeting at Raleigh	23 70
	20.	Postage, 16 packages instructions and placards to Superintendents of Health	2 88
		Express, 50 packages instructions and placards to Superintendents of Health	7 50
	22.	Raleigh Stationery Co., letter-scales	5 00
		500 postal cards	5 00
	29.	S. W. Battle, *per diem* and expenses annual meeting	12 50
		J. A. Hodges, *per diem* and expenses annual meeting	33 05
June	2.	Salary of Secretary for May	83 34
	12.	Postage on *Bulletin* three months	6 96
		Postage circular-letter, model ordinance, etc., to Mayors	5 00
	15.	Postage circular-letter to physicians, urging establishment of local boards	10 00
		Freight on typewriter	30
	17.	J. H. Weathers, difference in typewriter exchange	60 00
July	3.	W. H. Harrell, *per diem* and expenses annual meeting	29 50
		Office-rent January 1st to July 1st	30 00
		Salary of Secretary for June	83 33
	14.	Telegrams in regard to report of cholera in Northampton county	2 15
Aug.	1.	A. Williams & Co., rubber bands, 25 cents; ink, 40 cents	65
	10.	W. H. Harrell, *per diem* and expenses, investigation of epidemic of typhoid fever at Core Creek	30 80
	12.	Stamps, notice to physicians of biennial meeting of County Boards of Health	15 00

Aug.	14.	Postal cards, notice to lay members of same	$ 3 90
	17.	Salary of Secretary for July	83 33
		R. H. Lewis, expenses investigation of epidemic of typhoid fever at Tarboro	7 30
Sept.	1.	Salary of Secretary for August	83 34
	19.	Express, 20 packages supplies to new County Superintendents	3 75
	20.	Postage on other packages	3 64
		Stamps	5 00
		G. G. Thomas, repayment of money advanced for telegrams to Dr. W. H. G. Lucas in regard to reported case of yellow fever in Bladen county,	6 54
	30.	Other telegrams in connection with same case	3 84
		R. H. Lewis, expenses to Pan-American Medical Congress	43 05
		Express on supplies to two County Superintendents,	50
		Salary of Secretary for September	83 33
Oct.	28.	R. H. Lewis, expenses International Congress of Public Health	67 75
Nov.	3.	Salary of Secretary for October	83 33
		K. P. Battle, Jr., money advanced for telegrams during absence of the Secretary	1 60
	9.	J. C. Chase, expenses International Congress of Public Health	65 90
	10.	Postage—supplies to County Superintendents	94
Dec.	5.	500 postal cards for notices to delinquent Superintendents	5 00
	16.	Salary of Secretary for November	83 34
	30.	Postage on *Bulletin*—7 months, June to December, inclusive	28 56
		H. B. Baker, Treasurer, annual dues for 1893 to National Conference State Boards of Health	10 00
		Office-rent July 1st to December 31st	30 00
		Salary of Secretary for December	83 33
1894.			
Jan.	12.	Express on supplies to three County Superintendents	95
	20.	Subscription to nine copies of *Sanitarian* for members of Board	31 50
	23.	Express on supplies to a County Superintendent	50
		1 bottle mucilage	15
		Telegram to Boston for vaccine	62
		A. A. Reed, 100 vaccine points	7 00
		Telegrams in regard to reported case of varioloid at Wadesboro	1 69

Jan.	24.	Postal cards for interstate notification of contagious diseases	$ 3 00
Feb.	2.	Postage on January *Bulletin*	5 60
		Salary of Secretary for January	83 33
	10.	Express on supplies to two County Superintendents,	85
	13.	Raleigh Stationery Co., 1 stylographic pen	1 25
	16.	G. G. Thomas, *per diem* and expenses, investigation of Goldsboro water supply	9 50
March	2.	Postage on February *Bulletin*	5 84
		Salary of Secretary for February	83 34
	15.	Express on supplies to County Superintendent	45
		Express on Pennsylvania Health Reports for 1892 and 1893 to members of Board	2 25
	22.	Express on sterilized bottle from Washington	35
	23.	Express on sample of drinking water to Washington,	45
	27.	Stamps	10 00
	28.	Postage on March *Bulletin* (in separate wrappers with one cent stamp on each in compliance with orders from the post-office department),	12 65
April	2.	Salary of Secretary for March	83 33
	6.	Office-rent, first quarter	15 00
	10.	Subscription to eight copies *Doctor of Hygiene* for members of Board	4 00
	25.	Postage on April *Bulletin*	11 75
May	2.	Stamps	6 50
	3.	Salary of Secretary for April	83 33
	14.	J. T. Morris & Co., one set pigeon-holes	4 00
	24.	F. P. Venable, *per diem* and expenses annual meeting at Greensboro	19 50
June	1.	Postage on May *Bulletin*	11 70
	2.	Salary of Secretary for May	83 34
	4.	W. H. Harrell, *per diem* and expenses annual meeting at Greensboro	34 00
	14.	J. C. Chase, *per diem* and expenses annual meeting at Greensboro	25 80
		H. T. Bahnson, *per diem* and expenses annual meeting at Greensboro	13 90
	28.	Postage on June *Bulletin*	11 75
	30.	R. H. Lewis, annual meeting at Greensboro	9 05
		R. H. Lewis, expenses, trip to Goldsboro at request of Superintendent of Health	6 60
July	5.	Office-rent, second quarter	15 00
		Salary of Secretary for June	83 33
	7.	Express on sterilized bottles from, and samples of water to, Washington	95

July	14.	Freight and cartage on books for Secretary's office,	$ 47
	24.	Thomas Whittaker, books of reference for Secretary's office	55 05
	26.	Postage on July *Bulletin*	11 80
		Stamps	5 00
Aug.	1.	Salary of Secretary for July	83 33
	10.	Parke's Practical Hygiene	4 50
		Thomas Whittaker, works on hygiene for members of Board, including express charges on same.	113 97
	15.	Fee of Notary Public, application to enter *Bulletin* as second-class matter under recent act of Congress	50
	22.	Stamps	10 00
	28.	Postage on August *Bulletin*, second class	66
Sept.	1.	Overdue postage on Alabama Report	17
		Salary of Secretary for August	83 34
	12.	One combined desk and book-case for Secretary's office	6 50
	18.	H. T. Bahnson, *per diem* and expenses meeting at Salisbury	19 00
	21.	Express on supplies to two County Superintendents,	60
	22.	Stenographer, Salisbury Health Conference	15 00
		R. H. Lewis, expenses Salisbury Health Conference	10 40
Oct.	1.	Salary of Secretary for September	83 33
		Office-rent third quarter	15 00
	5.	Postage on September *Bulletin*	67
	8.	H. T. Bahnson, expenses American Public Health Association meeting at Montreal	73 95
	10.	J. I. Johnson, oil of peppermint for testing plumbing of D. & D. School at Morganton	6 50
		R. H. Lewis, expenses American Public Health Association	73 65
	20.	200 postal cards	2 00
	30.	S. W. Battle, *per diem* and expenses annual meeting at Greensboro and Salisbury Health Conference	55 60
Nov.	1.	Freight on bell-glass for microscope	83
	3.	Unpaid annual dues to National Conference of State Boards of Health for 1892	10 00
	5.	One bell-glass for microscope	3 00
	7.	Postage on October *Bulletin*	64
	8.	Raleigh Stationery Co., rubber type, holder, pad and carbon paper	4 20

Nov.	10.	Salary of Secretary for October		$ 83 33
	18.	R. H. Lewis, expenses inspection of D. & D. School at Morganton		17 65
	28.	Overdue postage on various publications		1 35
Dec.	1.	Salary of Secretary for November		83 34
	4.	Western Union Telegraph Co., sundry telegrams		1 71
	5.	Postage on November *Bulletin*		67
	6.	Extra typewriting		4 50
		G. G. Thomas, *per diem* and expenses Salisbury Health Conference		25 90
	19.	G. G. Thomas, expenses National Conference State Boards of Health at Washington, December 12th and 13th		38 40
	28.	Subscription to *Engineering Record* for Engineer of the Board		10 00
		John Whitehead, *per diem* Salisbury Health Conference		4 00
	29.	R. H. Lewis, expenses National Conference State Board of Health		36 30
		Subscription to eight copies *Sanitarian* for 1895 for members of the Board		28 00
		Thomas Whittaker, reference books for Secretary's office		20 83
		J. C. Chase, Engineer of the Board, *per diem* and expenses, sanitary inspection of public institutions and water supply and sewerage systems of cities and towns, as follows:		
		Asheville	$18 30	
		Charlotte	11 30	
		Chapel Hill, University	7 50	
		Concord	7 25	
		Convict camps at Castle Hayne and on the Roanoke river	22 80	
		Durham	8 40	
		Elizabeth City	12 50	
		Fayetteville	10 30	
		Goldsboro and Eastern Hospital for Insane	10 90	
		Greensboro and Normal and Industrial School and A. & M. College for the Colored Race	17 30	
		Henderson	9 05	
		Newbern	11 15	
		Morganton State Hospital and D. & D. School,	7 60	

Dec.	29.	Raleigh and Insane Ayslum, Institutions for the Deaf, Dumb and Blind, A. and M. College, and Penitentiary	$34 84	
		Reidsville	7 45	
		Statesville	10 52	
		Salisbury	8 35	
		Tarboro	8 22	
		Washington	13 80	
		Wilson	9 25	
		Winston and Salem	7 90	
		Time lost in travel and expenses during same,	19 35	
		Time preparing report, two days	8 00	
				$ 282 03
	31.	Office-rent, fourth quarter		15 00
		Salary of Secretary for December		83 33
		Balance on hand		265 46
				$4,555 04

RECEIPTS.

Amount on hand January 1, 1893	$ 530 29	
From subscriptions to *Bulletin*	21 75	
From sale of vaccine	3 00	
Appropriation for year 1893	2,000 00	
Appropriation for year 1894	2,000 00	
		$4,555 04

APPENDIX.

THE SALISBURY HEALTH CONFERENCE.

As constituting an important item of the Board's work, we append the proceedings, including the papers read, at a health conference *with the people* held at Salisbury on September 13, 1894. The following editorials will explain the reasons for it and give a short résumé, from which the reader can at a glance learn its scope and character:

MEETING OF THE STATE BOARD OF HEALTH.

At the regular annual meeting of the Board with the State Medical Society at Greensboro in May last it was decided to hold three meetings each year at different points in the State chiefly for the purpose of stirring up interest on the part of the people in sanitary matters. The first of these extra meetings will take place at Salisbury on Thursday, the 13th proximo. We go to press too early to publish the programme, but several papers are promised and we are sanguine of having an interesting and profitable meeting. As its prime object is to spread among the people a knowledge of hygiene and to enkindle interest in the practical enforcement of the laws of health, it goes without saying that the general public will be invited, not only to attend but to participate in the discussions. Indeed, it is hoped that it will develop into a general sanitary conference between the Board and the citizens, many of whom we trust will be present.

This question of reaching the people and sufficiently impressing them with the importance and value of the laws of hygiene to bring about their practical observance is the vital point in sanitary administration with us here in North Carolina, and we suppose elsewhere. As we have said more than once before in these columns, no law can be carried out that is not supported by public opinion, and we are striving to build up such a public opinion in favor of the most beneficent of all laws—those of health—without which happiness is impossible and life and liberty are hardly worth having. The almost invincible indifference of the masses of the people is most discouraging. Not long since in a conversation with a very intelligent physician of large experience and accurate observation on the necessity for the people of a certain settlement scourged with typhoid fever, whose water supply had been shown by bacteriological examination to be infected with the bacteria of the human intestine, to boil their drinking water, he remarked, "They would rather die than to boil their water," and we were forced to admit that he was probably right. While it is not flattering to our vanity to be compared with the peasants of Russia, we could not help being struck with the following, appearing in a letter from our Minister to that country to the Secretary of State on "The Cholera in St. Petersburg," printed in the last issue of the *Abstract of Sanitary Reports* published by the M. H. Service: Says Minister White: "A common remark among them (the Moujiks or peasants) when they are advised to use boiled water is that if Almighty God intended them to use boiled water the rivers and lakes would have been filled with water of that sort." But we are not without hope. Besides the fact of a slow but decided increase of interest in sanitation that has undoubtedly been going on since the establishment of our Board, steadily growing in volume and activity, we are encouraged by a collateral fact, viz., the growth among our people of a sentiment favorable to better county roads. A good many years ago it became our duty as a citizen to try to do something for the betterment of the roads leading into our city. We failed utterly in our first attempt—public opinion was against us. But to-day macadamized roads running out in every direction is a hard, stony fact, and road meetings are the order of the day in various localities. It has been said that "everything comes to him who waits"—and works—and reasoning by analogy we take heart and hope to see the day when the observance of the more important sanitary laws will be a matter of course. But we are anxious to hasten that day as much as possible, and any suggestions from our readers as to the best way to really impress the masses of the people would be gratefully received.

HEALTH CONFERENCE AT SALISBURY.

The meeting of the State Board of Health with the people, to which reference was made in last month's *Bulletin*, took place as advertised on the 13th instant. It was a great success. Nothing has occurred in our experience as a health officer so full of encouragement. The discouragements in sanitary work have been so great and so depressing that we can but rejoice at this evidence of a brighter day. It was like a cool breeze on a hot, sultry summer's afternoon; it has refreshed us and toned us up, it has filled us with the ozone of enthusiasm. It proved to us that the people could be brought out and that they would respond to proper efforts to interest and instruct them in the most important of all subjects.

The Board was peculiarly fortunate in this instance in having such a man as Dr. John Whitehead to take charge of the preliminary arrangements for the meeting. Being County Superintendent of Health for Rowan county as well as a member of the State Board, and possessing the respect and esteem of his professional brethren as well as the confidence and affection of the community, he was in a position to make his earnest and energetic efforts tell. He enlisted the interested support of his professional brethren of the town and county, the Mayor and other officials of the municipality, and a goodly number of the people, and this in the face of a reunion of the veterans of the county and an exciting political convention which took away many of the leading citizens.

Speaking for the Board of Health, we wish to put on record our appreciation of the cordial reception and interested attention given us by the profession and the people of Salisbury and Rowan county.

The following programme was sent in quantities to the Superintendents of all counties within easy reach of Salisbury in advance for publication in the papers and distribution through the mails. The attendance from beyond the limits of the county was, however, we regret to say, small. The presence of those who did come was, therefore, the more highly appreciated :

HEALTH CONFERENCE AT SALISBURY, N. C., THURSDAY, SEPTEMBER 13, 1894.

AIMS AND OBJECTS

The Conference is to be between the State Board of Health and health officers, both county and town, mayors and other municipal officials, and citizens generally who take sufficient interest in hygiene to attend. It is intended to be a meeting of the members of the Board with the people. Its object is to interest the people in sanitation by explaining and impressing upon them the great importance to the individual and to the community of a strict observance of the laws of health. As "the hand that rocks the cradle rules the world" the ladies are especially invited to attend. Every one present will be entitled to all the privileges of the floor and it is earnestly hoped that the discussions will be general.

Papers are promised on the following subjects :

The Sanitary Improvements of our Jails and County Homes.

The Prevention of Tuberculosis (Consumption) as We Know It To-day.

Quarantine and Disinfection in Relation to Contagious Diseases.

The Pollution of Drinking Water and Its Detection.

Drinking Water in Relation to Malarial Diseases.

An Instructive Epidemic of Typhoid Fever.

There will probably be one or two more papers of both interest and value.

Among other subjects to be discussed will be :

The Water Supply of Salisbury.

The Disposal of Waste and Excreta in Salisbury and Similar Towns.

In addition there will be a Question-Box, and members of the Board will take pleasure in answering to the best of their ability any questions bearing on hygiene.

You are cordially invited to come and bring your friends.

The meetings will be held at the Town Hall at 10 A. M., 3 P. M. and 8 P. M.

Best hotel, $2 a day.

Special railroad rates applied for. Inquire of ticket agent.

For further information, address Dr. John Whitehead, Salisbury, or

RICH'D H. LEWIS, M. D., *Secretary*,
RALEIGH, N. C.

The Board, in order to make the meeting as popular in character as possible, desired to have some prominent citizen preside, but we could not induce one to assume the responsibility. So the first or morning session was called to order by Dr. H. T. Bahnson, President of the Board of Health. The members of the Board and visiting citizens were cordially welcomed in appropriate words by the Rev. Dr. Murdoch, who, we think, if such an expression can with propriety be applied to one of his cloth, deserves the title "the near wheel-horse of the town of Salisbury," so active and successful has he been in advancing the interests of that goodly burg materially as well as spiritually. At the request of the President the Secretary explained the object of the meeting, essentially as set forth in the programme above.

The business proper of the session was begun by the reading of a paper entitled "The Prevention of Tuberculosis as We Know It To-Day," by Dr. S. Westray Battle, of Asheville. The idea that consumption was catching and that the disease could be prevented was a novel one to most of the audience, and this admirable paper, with verbal amplifications and explanations, was heard with much interest and elicited many inquiries after it was finished. It was the first gun in the campaign against tuberculosis by the Board. It was ordered to be published in pamphlet form for general distribution.

Following this was an excellent paper by Dr. George Gillett Thomas, of Wilmington, on the most important of all sanitary subjects, the very key-stone of preventive medicine: "Quarantine and Disinfection in Contagious Diseases." The questions elicited by Dr. Thomas's paper having been answered, the meeting, after a three hours' session, adjourned for dinner.

At the afternoon session a paper by the Secretary on "Drinking Water in Relation to Malarial Diseases," and one very instructive one on "Household Water Supply," sent by Mr. J. C. Chase, who was unavoidably absent, were read and discussed.

At night Dr. Albert R. Wilson, of Greensboro, County Superintendent of Guilford, read a very interesting and instructive communication on the

"Importance of Disinfecting the Dejections in Typhoid Fever," proving it by a lucid account of a recent endemic in his own county which, while small in extent, fortunately, was so plain as to cause and effect as to be practically self-evident. Dr. Wilson's paper was "the very thing" and added materially to the success of the meeting. "The Water Supply of Salisbury," which was next in order, was discussed, but not by the people of the town to the extent that we were led to expect. Upon its completion the Health Conference adjourned *sine die.*

Notwithstanding the fact that the day selected was unfortunate on account of other unanticipated conflicting meetings—that four members of the Board could not attend, and that we were deprived unavoidably of two papers on important and interesting subjects: "Sanitary Improvement of our Jails and County Homes," by Dr. Bahnson, and "Pollution of Drinking Water and its Detection," by Professor Venable, which had been prepared—the Conference was an unequivocal success. The large attendance, especially of ladies, from the beginning and increasing as the meeting progressed, and the active and lively interest shown prove it. We were assured more than once that we had sown good seed—had set the people to thinking, and had done much good. Such an assurance strengthens the Board for renewed efforts on the same line.

REPORT OF THE PROCEEDINGS OF THE "HEALTH CONFERENCE," HELD IN THE CITY OF SALISBURY, THURSDAY, SEPTEMBER 13, 1894.

The meeting was called to order by the President of the Board of Health, Dr. Bahnson, of Salem, at 9:30 A. M. Other members of the Board present, Drs. S. W. Battle, G. G. Thomas, John Whitehead and Richard H. Lewis.

Rev. Dr. Murdoch, of Salisbury, arose and welcomed the visitors in the following words: "Mr. President, ladies and gentlemen, I rise in behalf of the citizens of Salisbury to welcome these gentlemen to our city. They intend to hold conferences in the various cities and towns of our State for the purpose of endeavoring to arouse a greater interest in sanitary matters. There is no town that ought to give them a more hearty welcome than our own. Twenty years ago the health of this town was greatly injured by the proximity of a large pond, and under the influence of the medical profession this pond was drained. Since that time there has been a vast improvement in the health of the town, and the number of deaths in the last five years has been less than half of what it was. Inasmuch as the medical profession tells us that we may expect as great or greater benefits in the time to come, if we use the proper methods, we ought to extend to the Board a hearty welcome; and therefore, on the part of the citizens of this town, I wish to extend to these gentlemen, gentlemen who are known to us by name and fame, a most cordial welcome, and to wish them Godspeed in their work."

Dr. Richard H. Lewis, of Raleigh, arose and said: "Ladies and gentlemen, I desire to say to you that the understanding was that our distinguished President was to explain the object of this meeting, but owing to his extreme bashfulness he desires me to do so, and I of course have to obey orders."

Dr. Lewis then read the programme for the day, and continued: "Now, ladies and gentlemen, the object of the Board in having this meeting with the people is for the purpose of bringing to their attention some most important facts. We are all aware of the fact that no law can be enforced unless it is supported by public opinion. The object of these meetings is to build up a public sentiment in support of the health laws, the value of which has been shown time and time again. You would be perfectly astounded, and you would be perfectly horrified, if you realized the criminal (I say criminal unhesitatingly) negligence of some people in the matter of exposing their neighbors to various contagious diseases. It is the most difficult thing in the world to persuade people who have scarlet fever, for instance, in the family to have a placard put on their door, although the law declares expressly it shall be done. It will make them conspicuous, they say; it will produce the impression upon the community that they have a pest in the house, and they would be shunned by their neighbors. Now to illustrate: There was a case of scarlet fever in Raleigh, and the doctor told the mother of the child that had the fever that she must not let her children associate with other children, and by no means to let them go to school. She said it was not scarlet fever, and that she would not keep her children from school. He knew his woman, and so he went to the principal of the school and told him that scarlet fever was in the family, and not to admit any of the other children. But notwithstanding the fact that he had expressly forbidden these children going to school, they went the next morning, and if he had not taken the precaution to warn the principal they would have spread the disease broadcast over the town. Still she insisted that it was not scarlet fever, and went so far as to permit her neighbor's children to visit her children. The result was that two of them became sick, and one of them died. It was, not considering the motive, nothing in the world but homicide. That is a harsh word, but it was nothing less, and yet this woman was warned of the danger of letting her children associate with other children. Now I was talking to this same doctor about an epidemic that we have had down in one of our neighboring villages—about typhoid fever. I remarked that the people ought to boil their water if they insisted upon drinking the same well water. He agreed with me, but added that they would rather die than boil their water. And there are a great many people who would die before they would boil their drinking water. It is lack of faith; it is a want of faith, and what we are trying to do, ladies and gentlemen, is to increase your faith in the efficacy of these measures that have been enacted by the State entirely and only for the good of the people. There is nothing in the world that the Board of Health will make out of it, our only object being to improve the health of the people; and all we ask is that you assist us in this work, and that you obey the health regulations that have already been provided; and I believe that in the course of time you will find a still greater change for the better than there has been in the past. We hope that every one in the audience will take part in these meetings, and if you have any questions that you would like to ask we would be glad to have you do so, and to answer them to the best of our ability."

The President introduced Dr. S. Westray Battle, of Asheville, who read an interesting and instructive paper on the Prevention of Tuberculosis, which was well received. Dr. Battle arose and said: "Ladies and Gentlemen, in making these remarks upon tuberculosis, or consumption, we have come to a subject that interests us all; and in calling the attention of this Board and yourselves to the consideration of the means to prevent this tuberculosis—you can bear in mind, ladies and gentlemen, that when I say tuberculosis I mean consumption in the broad sense of the word—I wish to preface my remarks by disclaiming any motive except a conservative one."

SUGGESTIONS ON THE PREVENTION OF TUBERCULOSIS AS WE KNOW IT TO-DAY.

BY S. WESTRAY BATTLE, M. D., OF ASHEVILLE, N. C., MEMBER OF THE NORTH CAROLINA BOARD OF HEALTH.

Mr. Chairman:—In calling the attention of this Board to the consideration of measures to prevent the spread of the hydra-headed monster, tuberculosis, I wish to preface my remarks by disclaiming any intention of being other than conservative. It is so easy to become an alarmist, and when backed up by bald facts and figures, such as the history of tuberculosis offers, he must be phlegmatic indeed who is not stirred to his inmost soul by the contemplation of the ravages of consumption.

The brief remarks I shall make will simply be intended to open the discussion on the subject now agitating the world. So, then, Mr. Chairman, I want to know what we are going to do about the greatest scourge the human race has ever known? What are we going to do about a disease which annually carries off 7,000,000 people, and, coming closer home, strikes down 150,000 inhabitants of the United States, and, closer still, causes the death of not less than 4,000 people in the State of North Carolina? Think of it, within our sparsely settled borders ten deaths occur *per diem* from this dire malady, and yet we complacently move on, scarcely giving it a thought. It is simply consumption—we are used to that. It is part and parcel of our existence, we say. Still, let yellow fever or cholera threaten our borders, and town, county, State and Federal Government are up in arms and ready to spend any amount of money; yet this epidemic is nothing compared to the great epidemic of tuberculosis, which causes more deaths per annum than all the other contagious and infectious diseases combined. Contemplate 300,000 tons of consumptive bodies to be buried annually—just think of it! And think of the billions and billions of vigorous bacilli tuberculosis which lie under the surface of the earth, whose life-term is anywhere from five to twenty-five years. Bacilli have been found in the earth from cemeteries where inhumation has not been practiced for twenty-five years. Is it strange that consumption is increasing? And is it any wonder that with our present knowledge of the communicability of this disease the attention of every sanitarian is directed towards its suppression, since it is conclusively proven that rather more than one-seventh of the entire mortality of the world is directly traceable to it?

In order that we may the more intelligently devise ways and means for its prevention, let us briefly review the ætiology of tuberculosis and the manner in which it affects the human species.

Since Dr. Robert Koch, in 1882, announced to the world his discovery of the bacillus tuberculosis, our views in regard to this disease have undergone radical changes. It is now a fairly established fact that this bacillus is a specific pathogenic agent in the production of what we know as consumption. From time to time, as the discovery of the specific germ of other diseases has led us to take measures aimed at its destruction, so in this disease investigation is turning on more and more light upon the nature of this subtle enemy, sooner or later to be vanquished or modified, perhaps, as the small-pox has been.

This special bacillus or germ is a small vegetable parasite, rod-like in shape, having a length of about one-fourth to one-half the diameter of the red blood corpuscle, so that it would require from 7,000 to 15,000 of these tiny vegetable rods, if placed end to end, to measure one inch. The staining of these bacilli, so that they may be readily seen by the microscope, is easily done and a matter of only a few moments' work, and where there is the least doubt in regard to the diagnosis the physician should at once resort to his microscope.

Bacilli are said to be universally present in the lower stratum of the atmosphere, just as they are always found in the upper part of the earth, with the exception that tuberculosis is rarely ever found over ten thousand feet in altitude, and never found over sixteen thousand feet elevation. Scrapings from beds occupied by tubercular patients, the dust on the floors, on the walls, in the curtains, etc., and dwellings previously occupied by phthisical patients all teem with bacilli. Guinea-pigs injected with these germs die rapidly of consumption. Dr. Osler has estimated that from one and one-half to four billions of bacilli are expectorated daily by every well-marked case of phthisis.

It is hardly necessary to say that the bacilli are not alone found in the lungs, but frequently in every glandular structure of the body and in the bones. And we find it, too, in the disease called lupus, which is really nothing more than tuberculosis of the skin. So you perceive that tuberculosis does not always mean tuberculosis of the lungs, but the fact is we do recognize it most usually in the respiratory organs for the simple reason that they furnish the easiest mode of ingress, and there the bacilli are more likely to find a cultivated field in the bronchial glands and submucous tissues.

But a little while ago tuberculosis was considered hereditary. Now all is different. It is said that it cannot be born in an infant, but must be acquired. This is at least a source of comfort, for how cruel indeed would be the death-rate if to its now known communicability should be superadded hereditary consumption. But that an hereditary susceptibility, which is almost as bad as direct transmission of the germ, is the rule, is now a fairly well-established fact. Not all people are susceptible, nor even all the mammalia, though we know a large proportion of the human species is liable to become affected, and cattle, monkeys and guinea-pigs are most susceptible of the lower animals.

It has become common to speak of a person non-susceptible to a contagious or infectious disease as being immune. The great aim of the present day is to render the human species immune to the bacillus, and on this line Koch, Klebs and others are hard at work. A few years ago the former thought he had pursued the enemy to its lair and forever routed it by the manufacture of a lymph which is now commonly called tuberculine, and, with modifications, tuberculosidine. The world was agog, but was disappointed, for the wary bacillus, hidden in the fastnesses of the lymphatics, eluded its enemy, not always, to be sure, but often enough to make the remedy fall into some sort of disuse and disrepute. Yet the discovery was one of the greatest of the age, and along this line will yet be found, I predict, the remedy to render the human species immune.

What peculiar diathesis, we may ask, or hereditary tendency, is it that opens wide the doors for an entrance of this bacillus? Why some immune and so many not? I will answer that this susceptibility seems to be a condition closely allied to the strumous diathesis, a condition generally hereditary, but may be acquired, so that it is not uncommon for a subject to begin life immune and become susceptible through environment and affections other than tubercular. An untainted heredity is surely the most priceless gift of the Almighty.

By the way of illustration, the human species may be compared to nature's great cultivated field. Struma and its allies are the fertilizers, the bacillus tuberculosis is the seed, consumption the harvest. Let us take, for instance, two subjects, both apparently in vigorous health, but one with a strumous history, for we must not lose sight of the fact that a person with a strumous heredity is not incapable of the maximum of health, the latter is simply susceptible, the first is not. Inoculation of the first with a culture of the bacillis tuberculosis would in all likelihood produce no results. Tuberculosis would surely follow the inoculation of the latter. The first will go through an influenza, an ordinary bronchitis or pneumonia, and soon be as well as ever, whether the bacillus is present or not. The latter readily falls a victim to tuberculosis. As Dr. E. A. Wood has tritely put it: "A strumous person, an open sore, the presence of the bacillus, lymphangitis, bacillary consumption; that is the gamut of fate."

The lymphatic gland is the habitat of the bacillus tuberculosis, and the latter never enters a lymphatic gland without destroying it, but it is rarely, if ever, found in the blood. When found there it seems to be a pretty well-established fact that it is accidental and transitory, that it is on its way to one of the depuratory organs. Indeed, the blood is shown on to be intolerant of the bacillus and the blood corpuscles destructive to its life. When inoculation from the bacillus culture is done, the nearest lymphatics are soon engaged in a lymphangitis and in the susceptible subject general tuberculosis follows. The bacilli may reach the blood in many ways, but they never linger there. Their reception is unfriendly, and those that escape find their way into the nearest lymphatic vessels, there to do their deadly work, and with their swarming offspring proceed to other glands to kill and destroy. So its choicest pabulum is adenoid tissue, and all the remedial agents that have ever established any merit for themselves have been such as have acted upon this glandular system.

Sterilize the lymphatics and the subject is immune. Perhaps along this line of Pasteurism a guinea-pig, one of the most susceptible of the lower mammals to tubercular infection, may be made immune, and it appears to me as quite in the range of possibility, even probable, that products from its lymph may be used and the human species at last be protected against this now spreading poison.

Every tubercular patient is a menace to the community in which he lives. By far the most common means of spreading the disease is the sputum dried into dust and disseminated by the atmosphere into the lungs of innocent but susceptible persons. But this is not the only means of dissemination. The dairy is a common source of tuberculosis, especially in children, as it is estimated that three per cent. of the dairy cows near our large cities are tubercular.

To sum up the more common ways by which the bacilli enter the human system, we may mention inhalation, the ingestion of bacilli derived from mammals, either as food or drink, by using, or handling infected articles, as money, furniture, etc.

With our present knowledge, no open sore should remain an open sore any longer than possible. More especially should this be observed in the strumous subject.

Let us now briefly consider means for restriction or prevention of tuberculosis. Society must be educated, and surely legal methods are consistent with the highest civilization. We vigorously quarantine against other infectious diseases, as small-pox, yellow fever, cholera, etc.; then, in the name of the commonest of common sense, if tuberculosis is preventable, let the sanitarian overcome the difficulties, if difficulties do exist, and educate the masses, by authority invested in the Board of Health, by literature and every means in his power.

1. In the first place, then, every tubercular patient should be instructed by his medical adviser to see to it, by every means in his power, that others should not suffer through his own affliction, and that his own recovery hinges largely upon the scrupulous care with which he disposes of his own excreta and pathogenic secretions. Let him never expectorate where the sputum will dry. Ingenious paper sanitary cuspidors, cheap and easily procured, may be readily obtained, and these should be daily destroyed by burning. Persons suffering from consumption who spit on the floor or on the street should be subjected to a fine, if, indeed, such a punishment should not be meted out to him whether he has consumption or not. Some of my patients have found it convenient to carry in the chatelaine bag a small wide-mouthed bottle with rubber stopper, in which is poured every morning a small amount, a spoonful or two, of a solution of bichloride of mercury. Into this one may easily and inconspicuously expectorate, and avoid the use of handkerchief or napkin, which should never be used unless they are destroyed before they become dry.

2. Our State Board of Health should by all means make it obligatory on the part of physicians and householders to report to the local Board of Health all cases of tuberculosis, so that the State Board can properly

give instructions to patients and attendants, through their local health officers, of measures relative to the restriction of the disease. Such measures need not interfere with the individual liberty of the sufferer, or in any way hamper him in his usual avocation. The Board is already vested with such authority in regard to other contagious and infectious diseases, and the sooner we add tuberculosis to the list and enforce such regulations the better for the general public. For, as I have already remarked, tuberculosis is contagious, and is so recognized by every progressive medical man. In this connection I may say that it is within the walls of buildings that tubercular infection is almost entirely found, the chance of infection outside being almost reduced to a minimum as compared to the danger within. Intimate household life is responsible for the spread of the disease.

Dr. Flick, of Philadelphia, after studying the distribution of tuberculosis in a single ward of that city, found that about one-third of the houses were infected with pulmonary tuberculosis, and that in thirty-three per cent. of those infected there was more than one case; that is to say, that one-third of all dwellings contained tuberculosis, and of these one-third contained more than one case. Very few physicians of experience can fail to recall households where two or more in the family have died with the disease.

But since it is not hereditary the contagiousness thereof must appeal powerfully to any thinking man. More than a century ago, long before consumption was thought generally to be contagious, a law was enacted in Naples compelling physicians to report all cases of tuberbulosis to the Health Department under a penalty of a fine of three ducats; the second offense was punished by ten years' imprisonment. By the rigid enforcement of such a law, it is claimed that Naples has reduced her mortality from consumption ninety per cent. England and other countries are taking up the matter of isolation of tubercular patients, and are daily reducing their mortality from this disease.

There could really be no greater charity than establishing State Sanitaria in good localities for the segregation and isolation of the consumptive poor, where they could receive proper food and judicious management. Nor would this be poor economy when we consider, aside from the question of sociology, what an enormous saving would result, by the lessened mortality, in the thereby prolonged business activity of thousands of the State's best subjects. Society must by all means be protected, and how better than by the inauguration of such institutions, which we can readily see from the above would not, in the long run, prove a burdensome charity.

3. In the matter of the disposition of those dead of tuberculosis cremation should be the law, rigidly enforced. The body should be wrapped in sheets wrung out of a solution of bichloride of mercury and cre-

mated as soon as possible, for we have seen that live germs are found in cemeteries from two to twenty-five years after burial has taken place.

4. All dwellings and public institutions which have been exposed to infection from patients suffering from tuberculosis should be properly disinfected, and this should be a law. And all beds, carpets, curtains, etc., should be steamed for at least two hours. As a general disinfectant for washing walls, floors and articles of furniture nothing is perhaps better than a solution of bichloride of mercury, one part to a thousand.

5. The State Board of Health should have the power and means with which to cause careful and scientific bacteriological examinations in any case where the condition arouses the suspicion of tubercular infection, as in food products, milk, etc., as furnished in our cities and towns.

In conclusion, I cannot do better than suggest that we adopt the resolutions, relative to restriction of this disease, which were recommended by the Committee on the Restriction and Prevention of Tuberculosis of the American Public Health Association in Chicago, October last. These resolutions, as adopted, read:

1. The notification and registration by health authorities of all cases of tuberculosis which have arrived at the infectious stage.

2. The thorough disinfection of all houses in which tuberculosis has occurred, and the recording of such action in an open record.

3. The establishment of special hospitals for the prevention of tuberculosis.

4. The organization of societies for the prevention of tuberculosis.

5. Government inspection of dairies and slaughter-houses, and the extermination of tuberculosis among dairy cattle.

6. Appropriate legislation against spitting into places where the sputum is liable to infect others; against the sale or donation of objects which have been used by consumptives, unless they have been thoroughly disinfected.

7. Compulsory disinfection of hotel rooms, sleeping-car berths and steamer cabins which have been occupied by consumptives, before other persons are allowed to occupy them.

After the reading of this paper Dr. Bahnson said: "I would like to request the audience please to ask questions or to demand explanation about any points which they don't understand. Some of the terms are naturally obscure to those who have not read and studied the subject. This is a meeting emphatically for all, and we don't want to take up all your time and do all the speaking ourselves, and so please let the discussion be of a thorough and home-like character."

Dr. Whitehead said: "Dr. Battle gave us the remarkable information that ten people are dying daily in this country of ours of consumption. Now, if we knew that there was a man on the outside of this building with a knife who was killing ten of us a day, there would not be one of us who would not be after him with a shot-gun, if necessary, and yet it is the same thing. Ten of us are dying every day, and yet it is being done so easily and quietly that we do not think anything of it. The object of this meeting is to try and explain some means of expelling these various diseases which are killing our people all over the State. It is an informal meeting, and if your modesty is such that you don't want to ask any questions out, write them and send them up to the table and they will be read and answered."

Dr. Battle: "Mr. President, a question has been handed to me to lay before you; they want to know how milk in cows is known to be tubercular: what way there is of telling that cows have tuberculosis."

Dr. Battle: "The milk is known to be tubercular by the use of the microscope. There is a disease among cattle that is known as white distemper, which is nothing in the world but tuberculosis. I think it is called white distemper. The most usual way of discovering whether a cow is tubercular—and this should be always done when there is the least doubt—is by the use of 'tuberculine.' This tuberculine injected into a healthy subject will cause no reaction; it makes no change that you can see; but if the subject has consumption you have a group of symptoms that are unmistakable. There is a slight rise of temperature, sometimes a chill, and fever lasting for several hours; but it is so characteristic and so unmistakable that it is simply impossible to miss it; and you would be astonished to know how little tuberculine it takes to cause this reaction. If you will take one-sixtieth of a drop of tuberculine and inject it into a human being who has tuberculosis he will have a rise of temperature in two hours; and with the cow if the tuberculine is injected the temperature goes up and the same symptoms follow that show in the human system. Now, the meat of cattle infected with tuberculosis would not give us all consumption, because some of us are immune—that is, some are susceptible to the disease and others are not, and those that are not susceptible to the disease are called immune. I saw that five cats were fed on the meat of a tuberculous cow. Four of them ate the meat and the fifth one ate of a gland. In a week the fifth cat had tuberculosis and in five weeks died. Those persons who are subject to glandular enlargements, which we call scrofulous, are more susceptible than others. If we suspect that a cow is not healthy, then we should have the test made with tuberculine, which is just as easy as it can be. Many of our diseases of the spine with children are nothing more nor less than tuberculosis—not of the lungs, but of the spine. In the name of the commonest of common sense we should do what we can to suppress it."

Dr. Lewis: "Being somewhat of a dairyman myself, I will say that a cow is likely to show the same symptoms that a person does. She will cough and become thin. If a cow has a cough and is very thin, and if she is hard to fatten, if her hair is rough and stands up the wrong way, then you may suspect that she has tuberculosis, but the only way to find out with certainty is by the scientific method of tuberculine. Now, of course, you have not got any tuberculine, but if you will apply to the North Carolina Experiment Station they will put you in the way of having the test made. Now while I am up, and as I am a practical illustration of what Dr. Battle has said to you, I will state that I am the subject of hip-joint disease. My father died of consumption, and accordingly I always supposed that I had inherited tuberculosis of the hip-joint from him, but Dr. Sayre, who is a great expert, states that hip-joint disease is not an inheritance of tuberculosis, but due to injury. I always had believed that it was hereditary, but now in the light of the present day I understand how it is. I am one of the susceptible ones. Being a very active child I bruised my hip, and being susceptible to the disease produced by the bruise, exactly the soil that the bacillus would flourish in, so that, living in an infected house, and the bacillus, being in my circulation, found that spot, located and multiplied there, producing the destruction of the joint, and now you see how I am afflicted. I have been cured, however, and am a very healthy man. But I want to call your attention to the fact that if you have cows you suspect of being tubercular you had better have the test made at once."

Dr. Battle: "Here is another question, ladies and gentlemen, that has been handed up, 'Should consumptives marry?' Of course that question can only be answered one way. Consumptives should not marry. There is no need of going into that question, but they should not marry. There has been a case reported where a man with consumption had three wives who caught the disease from him and died, and yet he lived. Certainly a consumptive of that sort should not marry."

Dr. Lewis: "While we have a little lull I want to say that we desire to excite your interest and are anxious for your support. We want the ladies, especially, to take hold of the matter of sanitation and help us, as we know that the care of the household is with the ladies. If we can get them thoroughly scared as to these contagious diseases, and if we can get them to take hold of their husbands and sweethearts, instead of being the most unsatisfactory it will be the most grateful work that man ever undertook."

Dr. Murdoch: "I would like to ask Dr. Battle what measures ought to be taken in a school-house to prevent the germs arising from the sputum?"

Dr. Battle: "In answering that I can only say that there are many little things of great danger that escape us, such as a boy or girl using one another's slate. This is a common way of getting the germs from one to another; and the habit of swapping pencils and chewing gum should, of course, be avoided, and the school-room ought to be gone over with a cloth wet with a solution of bichloride of mercury every week or two. Then, I think, that there should be nothing on the floor that could not be removed easily. The school-room should never be swept or the dust disturbed while the pupils are in the house. They are the chief things that we should avoid."

Dr. George Thomas: "It seems to me, Mr. President, that there is one thing Dr. Battle might have added to that; that is ventilation and sunlight. The children are crowded necessarily, and therefore the ventilation should be specially provided for. Sunlight, too, adds not only to the general brightness of the room, but it prevents the growth of these germs. Then there should be a sufficient number of recesses, or recreation moments, during the day to let these rooms be thoroughly aired. It looks to me that without much disturbance the rooms might be thoroughly aired once every hour."

Dr. Lewis: "Excuse me for getting up again, ladies and gentlemen, but it seems to me that there is more danger in the bed-room than in the school-room; and we should always have plenty of fresh air, both in the bed-room and in the school-room."

Dr. Battle: "I will read a little extract from a paper published a few days ago in New York. It tells of a Medical Congress in France in August just passed. After going on about contagious diseases it comes to consumption, and so I will just read a few lines of this." He then read an article from a paper explaining the right ways of treating the bodies of consumptives after death.

Dr. Whitehead: "Mr. President, here is a question that has been given to me: 'Should cats or other animals, afflicted with these contagious diseases, be allowed to lie on top of the ground after death?'"

Dr. Battle: "I think, Doctor, that they should be cremated in the same way as a human person afflicted with tuberculosis. Certainly it should be very rigidly enforced that if we take care of and cremate human subjects after death we should certainly look after the cattle in the same way."

Dr. Bahnson: "Ladies and gentlemen, the next paper that we have is by Dr. George Thomas, of Wilmington, upon the question of "Quarantine and Disinfection in Contagious Diseases":

QUARANTINE AND DISINFECTION IN RELATION TO CONTAGIOUS DISEASES.

BY GEORGE GILLETT THOMAS, M. D., OF WILMINGTON, MEMBER OF THE NORTH CAROLINA BOARD OF HEALTH.

The act of the last Legislature, entitled "An Act in Relation to the Board of Health," wisely and efficiently provides for the quarantining of all persons sick with infectious diseases; and this quarantine has been as wisely provided by your efficient Secretary with full rules and regulations for both isolation and disinfection. The modern construction placed upon the word quarantine involves not only shutting off the sick and their necessary attendants from those that are well, but it absolutely insists that measures shall be adopted to destroy as far as possible the germs of disease by careful disinfection. This disinfection must begin as soon as the disease is manifested, and can only be finished when the sickness is over, and the patient is either well or dead.

There is unfortunately a wide-spread disposition among the laity to resist the enforcement of such regulations as limit their freedom to go and come at will or that seriously impair the comfort of the family or disturb the domestic routine. If they submit, too often the performance of the duties which disinfection puts upon them is negligently done, and half measures are worse than none; for they create a delusive security that is too often rudely broken. By a strange twist in human nature there is nearly always a disposition to applaud the imposition of sanitary measures when they affect one's neighbor, but these same rules become irksome and appear unnecessarily severe when they cross the fence and come home to the individual who was so sweetly disposed towards the proper treatment of his neighbor's ailings.

The labors of the bacteriologists, those persevering, delving folks that seek to reach that state of beatitude which is promised to those who know the cause of things, their works have made it evident beyond question, apparently, that all diseases which have a fixed and regular course of approach or incubation, attack and decline, and are imparted under favorable circumstances by an infected person to those who may be exposed, and who are not already protected by a previous attack of the same disease, all of these diseases are the products of specific germs. It is true that some persons are exposed or come in contact with disease and are not affected thereby, and it is claimed that there must be in the exposed person a condition which will allow the germs to reproduce themselves; in other words, the condition must be one of susceptibility. It is not within the scope of this paper to enter this part of the discussion. Nor does it involve the facts which it is my aim to set forth, except to say that disease germs grow best in fertile soi s as other seed, and that robust health and sanitary surroundings do not furnish the resting-place for disease.

It is true that as yet not all the diseases classed as *infectious* or *contagious* have been successfully searched for these specific germs. But those that have been separated are now very numerous, and the list is growing steadily. Each accession to the list so markedly declares the truths of the germ theory of disease that it is not too much to hope that in a time longer or shorter the diligent search of these tireless workers will find the morbid material of each and every ill to which mankind is liable. Such a discovery will bring with it new ideas of treatment and surer methods.

We read in the daily papers of the ravages of cholera in Europe and yellow fever in the tropics. Now and again, in spite of quarantine that is so rigidly practiced, the yellow fever creeps in and lays waste a town on the south-eastern seaboard. These defenses for prevention are all wise, and need to be constantly watched and renewed, but the monthly *Bulletin* of the Board of Health tells a tale that deserves our attention right in our own midst—a condition that bespeaks carelessness or wanton neglect. I refer to the frequent reports of the prevalence of typhoid fever in all parts of North Carolina. For instance, the disease was reported in sixty-six counties of the State in July. So great were the number of cases at one time in the summer of 1893 that the Board of Health seriously considered the advisability of an investigation into the causes of these outbreaks, and of suggesting some means for the control of the disease. Unfortunately the means for this extensive work were not in hand, and the only method for the change which we all so ardently hoped for was to urge the physicians through the *Bulletin* to look into causes of these localized epidemics and report them to the Secretary at Raleigh.

Early in the fall of 1893 I was in a small town in this State and had the pleasure to be closely associated with a very able physician. During my stay in his town he told me of so many cases of typhoid fever among his people that I was astounded at his statements. At the time of my visit he had three cases on his list, two in the town and another one a short distance in the country. As I rode through the streets with him he pointed out houses here and there where cases occurred and recovered until I was constrained to ask him if there was a family in the town which had escaped the disease, and it seemed there were very few if any. I do not mean that all this had occurred in one year, but in a comparatively few years, showing the continuance of the poison in the borough. The town is beautifully situated in the hills of middle North Carolina, and is the home of numerous wealthy and refined people who have enjoyed the benefits of education and travel; and yet they are all under the menace of this disease, unless luckily they have survived an attack and are immunized. It was not in my power to demonstrate that the drinking water of the town and the soil air were the causes of this lamentable state of things; but the location of the wells and springs that I saw and their relative position to the outhouses suggested a very probable solution of the difficulties. The drainage of the stables, cow-lots and places for the deposit of human *excreta* often seemed to have easy access to the well or spring. But the water was bright and clear, and its very sweetness masked the danger and *pro tanto* added to it.

This fever is such an old acquaintance that its modes of distribution have been popularly neglected, and a *laisser faire* policy has come in to blind the people to their danger, prompted by the feeling that these outbreaks are not to be accounted for or prevented, and must be set down as a woful dispensation of Providence. My friends, it is a disgrace to the faith of an humble, loving Christian to lay such a charge to a beneficent Providence. The people of Plymouth, in Pennsylvania, lived in a mountain village, and drank the water collected in a reservoir which was fed by springs flowing out of the mountain side. They were rudely awakened to the fact that their homes were invaded by an epidemic of typhoid fever, and no local cause could be found for its prevalence—so prevalent was the disease, and so dire the disasters attending it, that the community felt forced to call on the State authorities for help, and for physicians and nurses. They were met with prompt response. Hardly a home was left untouched by the hand of the destroyer, and the well were not strong enough in numbers to nurse the sick. The State Board of Health set up a rigid investigation into the cause of the epidemic, and for a long time their efforts seemed without avail. But one day in the wanderings of these tireless searchers they went well up the mountain side above the reservoir. Below them in the valley lay the town over which brooded the shadow of death, and between them and the stricken village was the reservoir full of sparkling water, glistening in the happy sunshine; its surface broken into wavelets by the balmy wind that gently drifted out of the mountain side and towards the valley. It seemed too much to lay the disease on that water, but not far away they found a cabin which contained quite a family. Inquiry elicited the fact that during the winter previous to the epidemic one or more members of this family had sickened with a fever, some may have died, but of this point I am not sure. The frank description of the sickness made it very clear that these people had suffered with typhoid fever, and when the inmates were asked what had been done with the watery *dejecta* of the patients, they said they were thrown out on the snow. The spring came and with it the thaw, and the germ-laden water was poured into the reservoir with such death-dealing results that men's hearts failed them in the great emergency. Don't call this a disposition of Providence, but a careless indisposition to protect the water-shed that supplied their reservoir. The loss of time and lives that resulted was only equalled by the flood that swept away the neighboring village of Johnstown.

Every foot that one digs into the ground for a well drains two feet surface; in other words, the radius of drainage is nearly twice the depth of the well. Add to this danger the inclines, too often existing between the kitchen back windows, the stables and the middens, all readily leading the water towards the spring or well, and the danger to which people recklessly expose themselves is fearful. The wonder is that they escape disease in some other shape, even if it fails to come as typhoid fever. The closet or midden can be made with a water-tight box or pail for the reception of *excreta*. Dry ashes, mixed with slaked lime and charcoal, can be kept in this outhouse, and a small portion of it be used whenever the midden is visited. The method is cheap, rational and reasonably effective. The receptacle, whether box or pail, can be removed, emptied of its contents in a safe locality too far away from the premises to affect the well or spring, and be returned clean for use again. Of course in case there should be typhoid fever in the house special precautions must be observed; but of this later on. It is better to prevent than to attempt to cure. There is some trouble attached to the care of the premises indicated above, but it is worth it. If your neighbor is careless your persistent cleanliness may be the cause of his reform, and the good results will spread if the earnest people will persevere in doing what is right. Don't pour kitchen slops on the ground; don't allow decaying parings of vegetables or other garbage to accumulate about the premises. If no other means for their disposal is at hand, put them away from the house and covering each day's deposit with slackened lime.

It is not easy to demonstrate the connection between the milk from certain dairies and cases of typhoid fever, but it is moderately certain that a connection exists, and so common an article of diet needs to be carefully guarded. The water the cows drink and the water used in washing the utensils in which the milk is kept ought to be especially looked after. Keep the stables clean and the lots dry; it preserves the health of the cattle. The cleanliness about all the premises does much to starve out disease.

The question of water supply involves so many items of great importance that in the short time allotted each paper at the meeting all the points arising under this discussion cannot be brought out. The disposition in all towns of much size and increasing population is to provide a public water supply. The protection it gives against dangerous fires in communities, as well as the convenience of such supply for domestic uses, probably often lead to the establishment of these water-works. Unfortunately the use of this water for drinking is too often an after consideration. For instance, the Board of Health had occasion to examine the water furnished one of the most prosperous towns in the State. The chemist's report made it very doubtful in quality, and a visit was made by two members of the Board to the town, and careful investigation was had into the source of the supply. This was a small river, running from its source through a large extent of farming country, and near the point of intake, within a mile, there emptied into the river three streams. One of these drained the edge of the town at a point inhabited by thriftless, dirty negroes; another came from a hamlet several miles away, and the third one had situated on its course, about a quarter of a mile from the river, a whiskey distillery. One hundred hogs were fattening upon the refuse of the distillery; the sour fermented mash was fed to them in shallow vats over the stream, and in the most hoggish fashion they wallowed in their food. The stream bed from the still-house to the river was the range of these animals, the sick and the well. It was polluted by their droppings and the slush that came from the feeding vats, and made an unwholesome addition to the water that the town people were to drink and bathe in. The lesson teaches that the towns having a public water supply must have the power to control for considerable distance the water-shed, and where the character of the water is doubtful that all the more improved means of purifying it should be adopted. But this is somewhat of a digression. Let us see what provision can be made for the disinfection of typhoid fever *dejecta*—how they can be made harmless. Section 21.*

I wish to say that no more instruction is needed than to follow the regulations issued by the Secretary of the Board. They are complete, comprehensive and concise, and do him great credit.*

To these let me add that if the persons in charge of a typhoid fever case cannot get the disinfectants prescribed in these instructions at once they will go a long way towards securing safety if they will see that the *dejecta* from these patients are promptly and freely covered with boiling water before they are emptied and that all soiled clothing is treated in a like manner before it comes out of the sick-room, to be again washed in boiling water afterwards.

The history of every epidemic of diphtheria will, I believe, show a thoughtless disregard of just such instructions as those issued by Dr. Lewis, the Secretary of the Board. They are not difficult to understand or necessarily the outcome of knowledge possessed only by physicians.

Thinking people will easily see, after a moment's reflection, that *all* communication with a house, in any manner, where diphtheria prevails must endanger their lives and probably lead to the spread of the disease.

The same is true of scarlet fever, and the ease with which the germs of the disease are transported makes it the more necessary to observe the precautions set out for its prevention. The quarantine of these two diseases may be fairly considered together, as they very often occur at the same time in the same patient, and as the measures are practically identical. We have said that the morbific germs are easy of transportation and transference. This makes it necessary to insist upon the isolation of the patient and the nurses and the preparation of the sick-rooms for this quarantine. All clothing that cannot be retained permanently in the room and may be destroyed afterwards, or that cannot be boiled and treated with the disinfectants already noted, should be moved out immediately after the attack is declared. If any of the clothing has been in contact with the patient it can only with safety be taken out under boiling water and must be boiled for an hour afterwards in one of the solutions noted in the instructions.

Woolen goods, if possible, ought to be steamed. Certainly they can be subjected to fumigation with sulphur fumes. Leather and rubber goods may be freely washed in a five per cent. solution of carbolic acid. Carpets should be removed if possible, or, if retained, should be burned after the patient is released. Safety has been insured, to my knowledge, by sweeping a carpet thoroughly with a broom kept wet with the bichloride of mercury solution. Don't allow any of your neighbors to come in unless it is necessary, however well-meaning they may be. Don't be deluded with the statement that they are not afraid. Unless they will submit to the rules of the quarantine and be disinfected before they leave the sick-room, they may and in all probability will become vehicles to send the poison still further on its travels. Don't forget that a piece of membrane on a rag, or in a vessel, if thrown out on the ground may be dried and driven into new quarters of attack by winds. Burn up the rags and disinfect the liquids before emptying the vessels. There is a form of pseudo membrane that attacks domestic animals. It is therefore best to exclude dogs, cats and birds from the sick-room, as they may become infected, or, at least, be carriers of the infection. Don't have the carpets and rugs from the sick-room, if they are not burned, beaten in the yard until they have been swabbed and scoured with bichloride solution after sulphur fumigation. Recollect that a person who has suffered from an attack of scarlet fever and has as its sequel a discharge from the ear for a long time carries about the germs of disease.

---

*See Act in Relation to the Board of Health and the Instructions for Quarantine and Disinfection incorporated in the Annual Report of the Secretary of the Board to the Conjoint Session at Raleigh.

Of small-pox there is little to be said except to absolutely isolate the patient and nursery until after death or recovery of the sick person, and then burn everything that has been used about the person, disinfect the quarters, whitewash or paint the walls. But don't forget that everybody should be vaccinated. That's prevention, and it is safe and certain.

I wish our legislators could be persuaded to enact a law similar to one just now in force in several of the States, that no child can enter a public school without a certificate of successful vaccination. Typhus fever hardly concerns us, so infrequent is its appearance outside of large cities and thickly populated communities.

When it becomes necessary to meet yellow fever, thanks to care of the Marine Hospital Service, the experts of this department will take charge. Cholera will always bring consternation, and little doubt that it will be promptly isolated and stamped out.

The fact that an attack of an infectious disease establishes for the person recovering from it a freedom from danger thereafter of the same disease has led the bacteriologists to study the phenomena of this freedom, an immunity as it is called. What the final verdict will be it is yet too soon to anticipate definitely, but there is a promise held out by the protection against small-pox by vaccination that in some way this process of immunizing may be so adapted to other diseases of an infectious or contagious character that the cases and their dangerous quality will be reduced to a minimum. Pasteur's inoculation against the poison of rabies has been more or less successful. Hoffkine seems about to justify his claims to be able to ward off cholera by protective inoculation. The French and Germans have exploited an antitoxine for the prevention or cure of diphtheria. So the work goes on. The days of the laborers in this interesting field are full of promise, and the nights of disease and fearful death seem to have given to them the hope of a coming dawn.

But this does not yet supply the want that unsanitary lives and surroundings create. In spite of warnings, in spite of the teachings of the doctor and even the secular press, the people put away from themselves the patent truths that cleanliness demands increasing vigilance, and vigilance in turn gives a reasonable hope of safety. The surgeon has caught the prime point of this lesson, and he is extending his field of work almost without limit. Regions of the body subject to disease and injury and needing the surgeon's care but which formerly were considered too dangerous to enter now lie ready for his exploring and curing hand under the rules of cleanliness.

The brain, the chest. the throat, the abdomen have all been opened, the organs have been exposed to view, diseased portions been taken away, the resulting gap been sewed up and health restored. The skill of the surgeon would not avail if he did not appreciate and apply to practical purposes the fact that success in his specialty demands that he, his assistants, his instruments and his surroundings should be clean. This is antiseptic and aseptic surgery. The presence of dirt means death, and its absence insures a chance for life in cases otherwise desperate. We must keep our environments healthy if we would be healthy. Disease germs can only grow and flourish in a fertile soil, which a hygienic condition of persons and premises does not afford. The individual who lives a sanitary life, that keeps his home and surroundings in a condition of sweetness and purity, does more to starve out disease germs and prevent sickness than all the drugs and medicaments of all the shops can ever accomplish for a cure when once the foe has laid siege to the body. If sickness comes in the shape of infectious or contagious disease besides the care for the patient and the sick-room clean up the yard, the stables and barns—look well to the enemy that is still lurking at the gate.

When the Carthaginians had carried home their mercenaries after the first Punic war they were sadly in arrears to their hired soldiers. In vain they sought to distract them from the demands they made for their hard-earned money. They made great feasts for them, amusements were provided and extravagant promises indulged in, all to put off the final day of settlement, hoping for some unlooked-for event to relieve them of the duty of discharging a just debt. The battle-scarred veterans grew impatient at the delay and their patience and confidence being destroyed, they broke into revolt against their officers and again demanded for the last time their money. No satisfaction being accorded them, they declared their intention to sack the city, and accordingly lay siege to it.

Every device that their training as soldiers had taught them was set in action against the beleaguered town, all the machinery that was known to warfare in that age was set in motion. They destroyed the food, they poisoned the water so that fish could not be caught, they cut off the food supply from the outer world, at the same time that they were spreading consternation and alarm by their persistent and ofttimes nearly successful attempts to make a breach in the walls. At last one man of their number, formerly a slave who had been liberated by them in an early attack on the city, at the risk of his life climbed up the arches of the aqueduct and made a breach in it, and the great city of Carthage was deprived of its water supply.

Disaster and death, an end of the war worse than a breach in the walls and the sack of the city, threatened the inhabitants, the people who had failed to do their duty.

So in despair they made sacrifice to Moloch. Innocent little children, in nowise connected with or responsible for the events that were frightening the lives out of these people, were cast into the fire to appease the wrath of the offended god. Tender women, their babes at the breast, slaves from the factories and mines, prisoners from the cells, made food for the flames of this fanatic ignorance. At last they went again to Hamilcar, their great general, whom for jealousy and envy of his fame and power they had set aside, and besought him to save them from the destruction that seemed imminent. He took charge, and after a series of battles, fierce conflicts set in order by his great genius and arranged to the minutest detail by his great experience, he drove the hordes from the walls into the plains and thence into the mountain fastnesses, to their death.

We burn sulphur and spread disinfecting solutions; we open the doors for the fresh air and the windows for the sunlight; we spend days and nights watching the sick, these victims to the Moloch of disease, and we recklessly pour the dejections from a typhoid fever patient, undisinfected, or carelessly done, on the ground at random, where the next rain will take up the poison and wash it into the water we or our neighbors drink; or it is dried, and the winds waft about the poisonous germs mayhap, and a new victim tells the tale of the reckless want of care.

A child lies sick of diphtheria. It is too much trouble to disinfect one's person or change clothes when the room is left. The nurse comes in contact with the other little children and a new case appears. It is too much trouble, it is said, to take up the carpets and carefully destroy the cloths on which the child expectorates or discharges the irritating fluid from its nose.

Another has scarlet fever. It is a sore trial to shut the door always against one's incoming and unwise friends and against one's own occasional escape. Trifling disinfection is done. False economy says don't destroy all these clothes and bedding; wash them; that is what this one or that one did, and they escaped. The doctors are unnecessarily particular they say. Alas! the enemy is still left hammering down the gates, and sacrifices to Moloch will not suffice. He must be driven from the home and destroyed. Don't temporize; clean up your premises, as well as your house, and keep them clean.

Sickness and death cost more in money than the time or the articles you lose, and who can measure the cost of weary days and nights of watching, or fix the loss that sorrow and grief entail?

Let me conclude my tax upon your time and patience by reciting to you the history of three cases of yellow fever that occurred during the Jacksonville epidemic. It contains all the lessons I have sought to teach you.

Dr. John Guiteras, of the University of Pennsylvania, is one of the best yellow fever experts in the country, as well as a most intelligent and cultivated physician and pathologist. He was formerly one of the surgeons of the Marine Hospital Service, and is yet, during his vacations, on the staff of that splendid department. He was present during the epidemic alluded to, and told me the fact I am about to relate. A certain man lived in Jacksonville for the greater part of the year, but had a country home thirty or forty miles from the city and a large saw-mill a few miles further on. He found that he was infected by the fever, and escaped by private conveyance, passing the cordon around the town and the detention in the camp which had been established for the observation and care of persons leaving the stricken place. He rode in his buggy to home in the country, sick with the yellow fever. His wife was a bright, intelligent woman, and among her many charming traits and virtues one of the best was a persistent determination to keep her home and its surroundings clean. She had succeeded, and the advent of her gudeman, laden with the germs of the terrible disease, made no disturbance in his home. Before his convalescence was complete he went down to his mill and had a relapse. The condition of things there was just the opposite of those existing at his home. He was domiciled and sick in a small house occupied and kept by one of his employees and his family. The refuse of the kitchen, the garbage from the house, the *excreta* of the inmates, those of the sick man included, were carelessly thrown in the immediate neighborhood of the house. The man grew worse, and one of the inmates of the house was attacked with a suspicious sickness, and Dr. Guiteras was sent for, and on his way went by and stopped at the home of the mill owner. About the time of his arrival at the mill the third person was attacked, and he immediately recognized in the two new cases the outbreak of yellow fever. Fortunately they all recovered, and the disease was stopped with these three cases. But mark the moral of the story. The sick man from Jacksonville goes first to his own home, mingling freely with the inmates of his house for several days, and grows better of disease. He is in a clean house, situated on clean premises, thanks to his most excellent wife. No one of his family is attacked. As soon as he can move again he goes to his mill, still a sick man, conveying the seeds of disease. He enters a home carelessly, slovenly kept, and the premises are, strictly speaking, dirty. The result is prompt to ensue. The atmosphere is polluted and fitted for the reproduction of the disease which he has carried with him, and two of his hands are seized. The timely arrival of Dr. Guiteras and his active efforts for the betterment of the surroundings put an end to a threatened outbreak of yellow fever in the pine woods. The application of the story is so universal that, in conclusion, it is only necessary to say: Imitate the example of this able housekeeper; keep your premises clean and enjoy the immunity from infectious or contagious disease that warded off the fell destroyer from her and her loved ones.

Gentleman in the audience: "Should pig-pens be allowed in a well-regulated community? Are they not promoters of disease of many kinds? Judging from the odor that we have had from these pig-pens on hot nights, it seems that they might be promoters of many diseases."

Dr. Thomas: "To that I shall answer, unhesitatingly, yes. It is impossible to keep a pig-pen clean, and they are so dirty that they must be promoters of sickness. It is a hard hing to drive the pig-pens out of a town—it was in my town; the poorer people thought it very hard to have their pig-pens driven out of the city."

Dr. Lewis: "Ladies and gentlemen, I wish to draw your attention to the fact that this quarantine is the key-stone to all disinfection. To quarantine is to surround the enemy, and when we have surrounded him the next thing to do is to kill him. It is of great importance that while we have our hands upon the germs we should destroy them, for if we let them escape there is no telling the amount of damage they may do. Now, a practical illustration: Scarlet fever appeared in a noble family in England. Several of the children had the disease. The family went away for a year, and the sick children recovered. That was in a day when quarantine had not been heard of. At the end of the year they returned, and one of the children's maids on looking into a bureau drawer found a little piece of red flannel that had been used on one of the sick children. Well, she was young and gay, and she threw it around her neck and danced around the room. The result was that the members of the family who had escaped the first time had the disease. We have a great many doctors that have been wondrously successful with diphtheria. One doctor will say that he has never lost a case of diphtheria. Another doctor will say that he has been very unfortunate with that disease; and yet we know that Doctor No. 2 is a very much better doctor than Doctor No. 1. How can we explain it? The cases of Doctor No. 1 were not true diphtheria at all. There was no germ of diphtheria, and therefore there was no danger, and for that reason Doctor No. 1 was so successful. Now that is the difference between the two cases of diphtheria; one is the real disease, the other something superficially like it. Of those cases where there is no germ none die; of those with the germs from 40 to 60 per cent. die. Remember that if you will destroy these germs while you have your hands upon them, you can avoid all these infectious diseases.

"Now, if you have any of these diseases in your family and don't quarantine your premises; in other words, if you do not prevent the neighbors from coming in to see you, or if you let the germs get out of your house and affect your neighbors, then you are guilty of criminal negligence. I wish to impress upon the audience, if possible, the great importance of this quarantining of cases of contagious disease."

Dr. Bahnson: "Is there any one else that would like to ask a question?"

Gentleman in the audience: "I have one which I know is very simple, but I would like to have it explained. It is about typhoid fever. A short time ago I was passing through a county in this State that was the driest and cleanest-looking country that I ever saw, and yet there is more typhoid fever in that section of the country than any section in the State. For twelve or fifteen miles there is not a creek or a branch. It is as dry and sandy a country as I have ever been through, and I have traveled a good deal, and there is more typhoid fever in that section than any place I ever saw in my life. There was one house in which the whole family had died of typhoid fever. There was one old man that had the fever, and we could not persuade him that he was not going to die, because everybody else around there had died."

Dr. Thomas: "Do you know what connection there was between the houses?"

Gentleman: "I do not know, sir. The country was very sparsely settled."

Dr. Thomas: "Were there any streams on any side to which the cattle might get?"

Gentleman: "There was one bottom."

Another gentleman in the audience: "Mr. Chairman, I think I can explain it. Several of these people have hog-pens and stables above their springs, and among other things I will say that the care of their sick is very poor. Instead of isolating the patient and keeping the patient to himself, the neighbors go up to the house at night, and sometimes you will find fifteen or twenty people in the neighborhood around there. They go in to see the patient. I went to a funeral down there where a man had just died of typhoid fever, and I suppose there were a hundred or one hundred and fifty people at the funeral, and against my advice there were about fifty women and about twenty-five babies there who went up by the grave where the open corpse was exposed to view. The doctors down there can verify what I say."

Dr. Battle: "I would like to say just a word in this connection. It is so hard to say exactly how this contagion is spread. In a prosperous city in England the people began dying of typhoid fever. They could not locate the cause, but finally somebody suggested that they look into the milk supply of the town. It was found that the people who had died of typhoid fever, and who had it in their families, all patronized a certain milk dairy. They supposed the typhoid fever originated there. At first they could not discover anything wrong. On examination of the dairy it was found to be perfectly clean, and everything seemed to point to cleanliness. Some one asked where the milk-cans were washed. It was discovered that these cans were washed in a well of water that had not been used for years. The milk was all right when it started, but these cans were washed in an old well that was found to be alive with the germs of typhoid fever. We say that typhoid fever can only come by drinking impure water, but it is not so."

Dr. Whitehead then moved that an adjournment be made until 3:15 P. M. This motion was carried, and the morning session adjourned at 1:10 P. M.

AFTERNOON SESSION.

The afternoon session convened at 3:30 P. M., and was called to order by the President, Dr. Bahnson. He then introduced Dr. R. H. Lewis, of Raleigh, who read a paper entitled "Drinking Water in Relation to Malarial Diseases":

DRINKING WATER IN ITS RELATION TO MALARIAL DISEASES.

BY RICHARD H. LEWIS, M. D., OF RALEIGH, SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH.

Many years ago the writer of this paper, before he had heard or read anything suggesting or supporting the view that malarial diseases were introduced into the system through the medium of drinking water, had his attention called to it in a striking manner by a statement of facts on the part of a relative living in one of our eastern towns.

The statement was that in her father's family, comprising so many persons who drank cistern water, malarial diseases were unknown, while in that of their next-door neighbor, consisting of exactly the same number of adults and children who drank from "the best well in town," they were rarely absent. My attention having thus been directed to the matter, it was not long before the opinion, which was confirmed by other evidence of a similar character, became a conviction, and for years I have not had a doubt that drinking water was one of the principal if not the chief one of the avenues by which the malarial poison obtained an entry into the human system. Until quite recently the opinion almost universally held was that it was introduced through the air only. The very name *malaria*, or bad air, is significant of that view. There is no question that the poison does exist in the air of warm climates in certain localities, especially in low, wet soils loaded with decaying vegetable matter, or in other localities not so low, but where the subsoil water is near the surface; that it is most abundant at night, particularly in the air nearest the ground, and that it is breathed in through the lungs.

As to the nature of the poison many theories have been promulgated. Up to 1866 the universally accepted opinion was that it was gaseous in character. In that year Dr. Salisbury, of Cincinnati, Ohio, announced the discovery of an *alga*, or small water plant, which he assigned as the cause of malarial fever. While his conclusions were not generally accepted, inquiry on that line was stimulated, and from time to time various microscopic organisms were suggested as the cause, none of which, however, stood the test of experiment. But "in 1881 Laveran claimed to have discovered in the blood of malarious subjects, in connection with the red corpuscles, rapidly moving filamented spherical organisms of about the same diameter as the corpuscles. * * * Many investigators who have followed in Laveran's track have corroborated his testimony, and hence there is a growing consensus of opinion that malaria is due to the introduction of *plasmodium malariæ* into the system; that it attacks the red blood corpuscles, lives and grows within them, and finally disintegrates them"—the explanation, by the way, of the familar fact that the subjects of chronic malaria are always very pale and bloodless. Since the above was written (in 1892) favorable evidence has accumulated, and it is now generally believed that this little blood parasite—this microscopic vampire, so to speak—is the cause of this kind of diseases.

Now, is this poison carried in water? That is the question before us. That it is a fact I have not a doubt, and my aim and hope is to prove it so completely to the satisfaction of our people residing in malarious districts as to induce them to seek such a water supply as cannot be contaminated by it. As the Executive Health Officer of the State, I feel sure that in no other direction can larger results in the way of preventing sickness be obtained than by bringing about a change in the family water supply from the ordinary surface well, almost universally used at present in the eastern part of our State, to *deep* driven or bored wells, or, still better, cisterns.

Appreciating and indorsing the sentiment expressed in a favorite saying of one of my former teachers, that he "would not give one barefaced, bald-headed *fact* for all the theory in the world," and realizing how much more effective an argument in the concrete, as it were, is than in the abstract, it is my purpose to attempt to make the demonstration, not by a process of abstract reasoning, but by the citation of well-authenticated facts, first as set forth in the writings of others; and, secondly and chiefly, as they appear in letters from our own "home folks" giving their personal experience.

As long as the gaseous theory prevailed it was natural that the water-transmission of the poison should not have been suggested itself; but as soon as it was shown to be a solid that view was brought forward, and first, so far as I know, by Laveran himself. The conclusions arrived at by him on this subject are: "There have been observed cases in which, in the same locality, persons living in identical conditions, but using drinking water from different sources, the one group being attacked in a large proportion, while the other group of persons are scarcely affected at all.

"2. In certain otherwise unhealthy localities the paludal fevers have been seen to disappear by supplying pure drinking water instead of the previously used stagnant waters.

"3. In localities otherwise healthy one can contract intermittent fever by drinking water from an unhealthy locality. The persons most affected are those who drink the water most freely.

"4. Travelers in malarial countries have found that on boiling their drinking water they escape the disease in a large proportion of cases."

Dr. H. Martyn Clark, of the city of Amritsar, India, in a most interesting paper read before the Scottish Geographical Society in April, 1892, says: "The malarial poison is usually breathed into the system, but it is, in my opinion, quite as commonly imbibed. Water is contaminated in two ways: either by the power it has of absorbing malaria which passes over its surface, or, in the case of wells, through the subsoil water. * * * In 1884 a party of workmen sent to repair a bridge over the Chuka drank of this stream, and out of thirty only three escaped fever, while several of them died."

In the article on "Malaria," page 350, Vol. II, of Stevenson and Murphy's "Treatise on Hygiene," 1893, the following case recorded by Boudin is quoted: "One hundred and twenty soldiers embarked in the *Argo* for transport from Bona, in Algiers, to Marseilles. During the voyage one hundred and eleven of them, thirteen of whom died, suffered from different forms of malarial fever. Two other vessels, carrying between them six hundred and eighty soldiers, also from Bona, and arriving at Marseilles the same day as the *Argo*, had no cases of illness at all, and the only ascertainable difference of circumstance between the troops in these ships and those in the *Argo* was the difference of drinking water. The latter were exceptionally supplied with water, which was said to have an unpleasant smell and taste, from a marsh near Bona; those on the other ships were supplied with good water. Finally the nine soldiers on the *Argo* who escaped were said to have purchased wholesome water from the crew of that vessel."

In an article by Dr. Bartley, on the "Relation of Water to Paludal Poisoning," in the *Brooklyn Medical Journal*, and republished in the *North Carolina Medical Journal* for February, 1893, these cases are quoted: "The villages of Warrington and Woolsey, in Florida, had been considered healthy places up to 1872. After that they became very malarious. Previous to that date almost the whole water supply had been from a spring of pure water. About 1872 driven wells became popular, as water could be had at a depth of a *few feet* (italics mine), and most of the residents had their own wells. From this time malaria became very prevalent, and it is believed from the change in the water supply." Again: "In January, 1866, a company of forty healthy marines were sent to the Navy Yard of Pensacola, Fla. During the first year frequent attacks of malaria began to show themselves among these men, which increased in number during the second year, and during the third year the disease became so prevalent that before August twenty-five of the party were in the hospital at one time. During this year they were so broken down that they were all sent to Norfolk, Va., where they all recovered. These marines drank the water from a driven well at the yard. The officers and their families drank only from a cistern, and no case of malaria appeared among them, proving that the wells were probably the cause of the sickness among the marines." Dr. Bartley also quotes this from the *Sanitarian*, 1892: "In 1875 the Naval Hospital at Pensacola was rebuilt. It proved to be a very unhealthy place, malarial diseases being very commonly contracted by patients and all others who came there. This continued until 1890. At this time there was a change in the water supply. A cistern was constructed, and the use of well water from the driven wells was abandoned, with the cessation of malarial attacks. The soil at the location of the hospital is composed of a sandy top with a swampy marl underneath. This peaty soil contains organic matter, and in some way produced these diseases." Likewise this: "In the report of the Marine Hospital Service for 1890, page 12, signed by Surgeon General Hamilton, he says: 'The experience of the past year confirms the previous statement that malarial diseases are contracted through the medium of food and drinking water.'"

In the April number of the *Southern States* there appeared a very interesting article by Mr. James R. Randall on "Malaria Superstition and the Water Problem." While not prepared to indorse Mr. Randall in the opinion that the malarial poison is not introduced into the system at all through the air, but through the drinking water *only*, I am much pleased to quote, in part, his statement of facts. He says: "A large part of Southwestern Georgia was a pest-hole. It was proverbial for chill and fever—generally styled malarial fever—hæmorrhagic fever, and a variety of choleraic symptoms. Mr. Fort by experiment disclosed that Southwestern Georgia was in the artesian basin, and that, by boring about six hundred feet below the surface, flowing wells or energetic geysers were easily developed. As these splendid fountains of pure water were commonly utilized there was an instant, a magical change of sanitary character in that region. The diseases hitherto ascribed to the air vanished, and that section of the State became a sanitarium, the healthiest of localities. The old conditions of environment remained, but the mutation was in the water supply. The man who with this object-lesson before him still clings to malaria may exist, even in the artesian region of Southwestern Georgia, but he is a veritable dweller in the cave of Adullam, and with some brethren an ancient superstition of this character dies hard and lingeringly.

"At several places in South Carolina, as well as in Georgia, the most wonderful results have followed from the introduction of artesian water. Yemassee, in the rice country, long regarded as a death-trap, became exceptionally salubrious, and its water was in request all around. Langley, S. C., a manufacturing village, had an evil repute for 'malarial' fevers. The cotton mill there sometimes closed on account of sickness among operatives, and was habitually crippled. So soon as the surface wells were discarded and water obtained from a natural geyser, a boiling spring in the vicinity, there was an astonishing metamorphosis. The place became noted for health; the factory was always full-manned. Its stock improved in price, dividends were regularly paid, and out of reserve funds the capacity of the concern was nearly doubled. It was with great difficulty that the managers were convinced that it was surface water and not the atmosphere that had previously wrought such disaster.

"On swamp plantations, where since the beginning of the century disease and death from fever raged, artesian water performed its usual prodigies for white and black. On a plantation near Augusta, where the white people used this water and the negroes insisted upon drinking from surface wells, the contrast was marked. The whites had uncommon freedom from malady and enjoyed splendid health, while the negroes were constantly sick."

I would call attention just here to the fact, accepted among scientific observers, that the negro races are less susceptible to malaria than the white races, which makes the illustration given still stronger. Mr. Randall goes on to add: "It was demonstrated on these places that the swamp air is as pure as that of mountain top," a conclusion, however, that no one familiar with the literature of malaria can accept—yet awhile, at any rate.

The following from an article by Dr. W. H. Daly, of Pittsburg, Pa., in the *Medical Record* of September 15th, is extremely valuable, as coming from an unacclimated physician exposed to the conditions most likely to cause malaria:

"Observations and studies on the subject, and investigations made in various districts from Manitoba to Louisiana, and all along the southern coast of the Atlantic Ocean, and of Cuba, Yucatan, and other districts in Mexico, lead the writer to the conclusions that so-called malarial disease is not easily, if at all, contracted by inhaling so-called malaria or bad air of the low, swampy, or new lands, but it is distinctly, if not almost exclusively, due to drinking water that has come into contact with and become infected with the malaria germs or infusoria that exist in the earth and waters of the swamp and lowlands. This germ does not ordinarily, if at all, float in the air during the day, nor does it find easily a vehicle in the fog or vapors of the night. * * *

"I am fully aware that in taking the ground I here occupy I may be considered to be too radical and that my position may be regarded as untenable. If so I can only answer that every observing medical man must and is bound to tell honestly and fairly what he has gathered from his own experience, observation and studies, and it must be considered that my observations have been prolonged, extensive and fairly intelligent, and made not, so to speak, second-hand, but personally and upon the ground in districts distinctly malarial, and that during the years that I and others had been careful to avoid the mists and fogs of the malarial regions as well as the outdoor night air, but all the while using the surface, swamp or shallow well waters for drinking, I as well as others of my friends suffered from malaria, so-called; but later on and during the past twelve years, while abstaining from drinking the surface or well water and with the utmost freedom of exposure to the outdoor night air, fogs, rain and mists at all times, night and day, we have enjoyed complete immunity.

"Whoever has shot wild fowl knows full well that the best opportunities come to a sportsman amid storm and rain, with the early mists of the morning and when the marshes are redolent with the vapors of the evening, just at nightfall, when the wild fowl are flying to and fro, seeking their favorite haunts in the marshes to sleep.

"Then there is the journey of miles homeward to the club-house, farmhouse, or camp, in the small ducking-boat, that brings one to the fireside possibly not earlier than eight to ten o'clock at night, so that exposure is positive and close to the marsh and water, as one is sitting in a small boat.

"I mention the foregoing as relevant, since medical men are still the readers and learners from the classic text-books of Watson, Tanner and Niemeyer, not to speak of many others."

Remembering how very conservative a rural population always is, and how suspicious and sceptical a great many of them are of statements printed in a book, particularly when those statements set forth views that they are loth to accept, and are made by strangers living a long way off, I concluded that it would be best to obtain the bulk of the evidence from our own people. With that end in view the following circular-letter was sent to every registered physician in all the counties considered malarial:

"North Carolina Board of Health,
"Raleigh, N. C., April 20, 1894.

"Dear Doctor:—The evidence that malarial diseases are introduced into the system in many if not most instances through the medium of drinking water is, to my mind, conclusive. The water containing the germs or plasmodia is surface or superficial soil water. Those living in malarial districts who confine themselves to water from cisterns or wells driven or bored beneath the stratum of marl or impervious clay—in other words, beyond the water which soaks down from the surface—are to a large extent free from attacks. If the people of our eastern counties could be generally convinced of this fact, and thereby induced to act upon it, the health conditions of that really fine section would be revolutionized for the better. To bring this about is the object of the Board of Health. In order to do this facts must be presented to them in the concrete—not by illustrations from "Asia and Spasia and t'other side o' Hillsborough," so to speak, but by instances from among their own neighbors. I write to ask if you know any facts bearing on this subject and, if so, that you will write them to me in detail at your earliest convenience. Give the name and post-office of the head of the family having the experience. If not personally familiar with the facts send me the name and address that I may write him direct.

"Your kind and prompt attention will greatly oblige,
"Yours truly,
"RICH'D H. LEWIS,
"*Secretary.*"

To this forty-two replies were received, seven of which, having no special bearing on the point at issue, have not been used. Not being satisfied entirely with the evidence thus obtained, and desiring particularly to have as far as possible specific, detailed statements of actual personal experience, I sent the following circular-letter to every one using cistern or driven well water whose address I could get:

"North Carolina Board of Health,
"Raleigh, N. C., August 1, 1894.

"My dear Sir:—The State Board of Health is investigating the question of the introduction into the system of the malarial poison through the medium of the drinking water. We believe that there is much evidence to prove that persons drinking water, from cisterns especially, and also from wells bored or driven below the impervious layer of clay or marl, are less subject to malarial diseases than those drinking from shallow wells.

"If this fact can be demonstrated upon 'homespun' evidence by a statement in detail of the experience of our own people, which would make a deeper impression than that from foreign parts, we hope by disseminating this evidence widely among the residents of the malarious regions of our State to so augment the use of the purer waters as to revolutionize their health records.

"We believe it can be done, but we must have a detailed statement of the evidence. For example, something after this sort: 'Up to ------ date my family used water from a well (describe well) and we had ------ cases of malarial disease (or our doctor's bill, for malarial diseases chiefly, was ------). Since that time we have been drinking cistern (or driven well) water, and the attacks of malaria (or doctor's bill) have been so and so.'

"Your name has been handed to the undersigned as one who has probably had such an experience. Will you not, in the interest of the health of your neighbors and the material prosperity of our State, *promptly* transmit it?—to

"Yours truly,

"RICH'D H. LEWIS,

"*Secretary.*"

To this thirty-seven replies were received.

In order to give a general idea of the drift of the letters from both sources I have classified them under the following heads:

	Medical.	Lay.
Favorable	10	22
Unfavorable	1	4
Indifferent, but generally favorable rather than otherwise	31	11

LETTERS FROM PHYSICIANS.

In order to save space the irrelevant portions of the letters following have been omitted:

Dr. Will J. Gilbert, Mill Prong, Robeson county:

"Your circular received. Very glad indeed to see the interest taken in drinking water as medium of malarial disease. I have been in the north-eastern portion of Robeson county for the last five years. First two years had much malarial trouble to treat; since then, up to present time, have had comparatively none, due entirely to the use of *driven wells*, ranging from twenty to thirty feet in depth. Among many instances

I could quote one family. Mr. Stephen Thrower's suffered greatly, his bill averaging high up, with narrow escape of his sick from death. I had to interdict the use of well water or to have the same boiled before marked improvement became noticeable. I pleaded with Mr. Thrower to get a driven well, and assured him of perfect immunity from future trouble and expense. He did so, and now, instead of monthly visits and big bills, I am never called save occasionally in trivial troubles. Again, Hon. D. P. McEachin's family experienced the same benefit, also the families of Hon. Ed. Purcell, Mr. T. I. McNeill, Mr. Natt McPhauls, Mr. Lige Gibson, Mr. J. B. Weatherby, and many others. One noticeable case few months back: Wife and children and father suffering from malarial ills near the Cumberland county line, medicines affording but temporary relief—cases chronic and office patients. Upon my first visit I visited his well, and found his water polluted by the nastiness of his yard, foul in smell, of bitter taste, and milky in color. I called Mr. Graham's attention to the source of his troubles. He had a driven well put in use at once, and to-day the sallow, dejected, woe-begone patients are bright, with buoyant spirits, good appetites, clear, healthy skin, under pure water and precious little physic. I venture the assertion that the driven wells in Robeson county have saved thousands of dollars and many lives since their introduction. One case near Fremont, Wayne county: Mr. M. T. Johnson before the driven wells had much malaria; since the use of water from his driven well no malarial troubles. I could give you much personal experience as practising physician of eighteen years in Eastern North Carolina and this section as to the marked benefit to health from change to drinking water from driven wells. Facts sustain your reasoning.

"One more case sustaining your reasoning: At the John Gilchrist place, in the county of Robeson, occupied in 1889 and 1890 by Mr. Archie McQueen, wife and seven children, malarial fever of malignant type prevailed; four of family sick; duration of attacks six to eight weeks; visits every day; every sanitary measure exercised; water from well boiled; patients recovered, to be taken again every fall; father not disposed to have a driven well, and the place finally abandoned. From the great amount of sickness of this family and the death of a Mr. McLeod, who moved in after the McQueens left, the place was looked upon as a grave-yard, and a party from South Carolina—one Mr. Quick—being offered the place at a low price, declined to purchase before consulting me as to the health surroundings. Mr. Quick, wife and one child now occupy the place, and enjoy freedom from malarial troubles by virtue of the driven well used at my suggestion. So it is all over this section. Where the driven well is used there is no sickness from malaria."

Dr. Samuel Morril, Farmville, Pitt county:

"Your circular of April 20th received. In the section of country I travel over open wells are the rule. Driven wells are now being used to some extent, with improvement of quality of water and general health. I have been urging this matter personally for some years. B. M. Lewis, P. O. Dongola, N. C., congratulated himself that the year after he bored a well his doctor's bill was less than it had been in years.

"John T. Barrett, Farmville, N. C., is, or was, enthusiastic on the subject of driven wells, and undoubtedly there has been less malarial trouble in his family.

"Sufficient time has not passed in other cases to prove anything—less than a year only since commencing their use."

Dr. W. W. Lane, Wilmington, N. C.:

"In regard to your remarks on the production of malarial diseases from the use of surface water, which includes our shallow wells, as well as branch or ditch water, you are certainly correct. I have made many observations concerning this question during my past life, and have been long thoroughly convinced that surface water drinking plays a far greater part than climatic influence in causing malarial fever, as well as many of our hepatic troubles, including obstruction, jaundice, colic, congestion of the liver, etc."

Dr. J. F. Garrenton, Coinjock, Currituck county:

"I agree with you as to surface water, etc. I believe that three-fourths of the diseases in this low, flat country are produced by malarial poison, and most of it is taken into the system by drinking-water (surface water). I have a well or pump driven twenty-seven and one-half feet deep, and there are no malarial diseases in my family. Cisterns will not do unless they are perfectly tight, and no water exposed to the air in any open vessel or well in this country is fit to drink, for it will absorb malarial poison."

Dr. A. B. Pierce, Weldon, Halifax county:

"While I cannot call to mind any particular locality affected to any considerable extent by surface water as the cause of malarial diseases, yet I agree with you, and give it as my opinion, after an observation of fifty years, that surface water, as a drink, is the fruitful source of much of the malarial trouble of malarial districts. As an instance: In the region of country in the lower part of this county and the counties adjacent the wells are very shallow, and the drinking water must more or less partake of the surface water, as in a great many of the wells the water is but a few feet from the surface. It is my observation that regions of country thus situated are subject to a great extent to malarial troubles.

"As another instance of the opposite of this the wells in the section around Weldon are generally very deep, and but little or no surface water has an opportunity to vitiate the water. The wells are mostly bored or otherwise protected from the surface water. Since the town has been drained in the last twelve or fifteen years I suppose that we have as little malarial trouble as any section of North Carolina; and I attribute its exemption from malarial disease to cistern water, bored wells, and wells protected from the surface water."

Dr. Alpheus Fields, Aurora, Beaufort county:

"After an experience covering seven years I must say that I am of the same opinion as yourself respecting the development of all malarial troubles. Filtered rain-water, well-drained and well-*whitewashed* premises are in almost all cases sure malarial preventives."

Dr. Thomas M. White, Belvidere, Perquimans county:

"I am interested in the subject of which you write. The inhabitants of this little village abandoned their wells as the principal source of drinking water about ten years ago. The health of the inhabitants has materially improved since they have been using cistern water. If there was no other source from which they could get water the results would be more perfect, and I am sure better."

Dr. George N. Ennett, Beaufort, Carteret county:

"Since the introduction in many localities of long-pipe driven wells malarial troubles have greatly diminished."

Dr. L. L. Staton, Tarboro, Edgecombe county:

"My attention has for years been in the direction of the supply of drinking water. A few years ago I came in possession of a farm with a mill-pond on it, and with the reputation usual to such localities of being very unhealthy. After owning it for a year I found that malaria abounded. I had all the open wells filled, and, there being several good springs on the place, the filling of the wells necessitated the use of the spring water. The malarial diseases were very much lessened, and continued to grow less from year to year, until the miller re-opened a well for his own convenience, but against orders, and but a short time after his very large family was sick from malaria. Upon refilling the well the malaria soon disappeared.

"In building a cotton oil mill on the place, so much impressed were the proprietors with the danger of malaria from open wells that a cistern was built. It has been my universal advice in practice to suggest a cistern, and next to that a driven pipe; and in all cases where the cistern has been built and kept in proper condition the malarial troubles have been greatly reduced, and, in some instances, entirely disappeared.

"At first the driven wells seem to have a beneficial effect, but after a while they are infected. My observation is that the neighboring farms have much more malaria than the farm alluded to. The amount paid for medical attention on the farm has been decreased at least one-half from former years, notwithstanding the number of laborers has been doubled.

"Good and properly prepared food and pure water will, in my opinion, effectually stamp out all malarial diseases in Eastern North Carolina."

Dr. W. H. L. Goodman, Franklin, Va.:

"I came to this place in 1865 and resumed the practice of medicine. I found malarial diseases very prevalent — in fact, from that time up to 1887 our people suffered greatly from chills and other malarial troubles. In 1887 the first artesian well was put down, from which we received a supply of excellent drinking water which at once took the place of the old surface wells, and a decided improvement in the health of the entire community was immediately noticeable. This well was followed by others, and we now have twenty-five in number, each averaging a flow of fifteen gallons per minute, or a grand total of over five hundred thousand gallons every twenty-four hours. Since 1887 the population of Franklin has doubled, and malarial troubles are almost entirely unknown. The general health of our town is excellent. Our wells average one hundred and forty feet in depth and the temperature of the water is 60°."

FROM OTHERS THAN PHYSICIANS — THOSE USING CISTERNS.

His Excellency, Governor Carr, Old Sparta, Edgecombe county:

"There is no question in my mind as to marked improvement in the health of those using cisterns over those using water from the open wells."

Hon. George H. Brown, Jr., Washington, Beaufort county:

"There has been a very marked improvement in the health of families using cisterns."

Mr. W. P. Baugham, Washington, Beaufort county:

"My family use cistern water altogether and we never have any sickness at all. I agree with you that the shallow well which takes the surface water does the work, and so few of them arranged to let rain-water drain off from them. I have known them to allow rain-water to run in and fill well. We never use a physician for sickness such as you name."

Mr. David Pender, Tarboro, Edgecombe county:

"In 1859 I built a comfortable home in Tarboro, and for eight years my family frequently had chills and fever. Dr. Pittman, our family physician, stated to me that the use of cistern water was the only cure for our ills. I had a cistern made immediately and for more than fifteen years we had no fever whatever.

"Six years ago I rented my home to a large Jewish family, who have just informed me that they had no fever during the six years.

"We use cistern water in our store and not a single case of fever for years among our employees. I have boarded at Hotel Farrar for six years; we drink cistern water, and scarcely a case of fever in the hotel during the six years."

Mr. John F. Shackleford, Tarboro, Edgecombe county:

"At home we use cistern water entirely and have cistern thoroughly cleaned out every November and catch no water after March 30th. Have never had a case of malarial fever on the lot.

"At my mills we worked one hundred and twenty hands and used well and spring water and had a great many cases of typhoid fever and dysentery, so serious that I had a driven well, about ninety feet, put down and got good water, and the result was have had little or no sickness since."

Mr. L. Heilbroner, Tarboro, Edgecombe county:

"I have been a resident of this place since 1868; have resided in three different localities of the town, and prior to the fall of 1891 my family used drinking water from wells not over twenty feet deep. Up to 1891 we rarely escaped malaria and had three cases of typhoid fever, one of which terminated fatally. As a result my yearly doctors' bills were very heavy, as we had malaria every year. In the fall of 1891 I built a cistern, and I am happy to state since that time scarcely any member of my numerous family has had a chill and my doctors' bills from that source are comparatively nothing."

Hon. Kemp P. Battle, State University, Chapel Hill:

"In regard to the drinking water and malaria question, I am able to make the following contribution: The late Mr. Paul C. Cameron, an an observant and accurate man, and a very wise manager of slaves, told me that he and the Hon. John Y. Mason, of Virginia, bought adjoining plantations on the Mississippi river and removed many slaves to them from North Carolina and Virginia at the same time. He (Cameron) provided tanks and rain-water, while Mr. Mason did not. The result was that the Cameron negroes were as healthy as in North Carolina, while the Mason colony suffered greatly from malaria."

Mr. George A. Spencer, Washington, Beaufort county:

"Up to the year 1887 we used well water in our family—that is, we used it for about seven years previous to that time, and during that time we had four cases of typhoid fever in our family besides cases of malaria. Our doctor's bill during that time was near one thousand dollars. Since that time we have been using cistern water, and our general health has been very *good* and our doctor's bills have been very *small*. The wells we used water from were surface wells. It is our opinion that the water we used at that time had a great deal to do with our health."

Mr. J. B. Whitehurst, Aurora, Beaufort county:

"Up to March, 1890, my family used well water, and my doctor's bill was from $60 to $130 per year. Since March, 1890, we have used cistern water. I have not paid $50 doctor's bill in three and one-half years. I lost three children up to 1890, and I carried my family to the sea-coast. Since 1890 my family has remained at home and had no need to go off for health. Encourage all to have cisterns. I speak from experience."

Mr. J. A. Perry, Scotland Neck, Halifax county:

"I have long since been satisfied in my own mind that more malarial poison is taken into the system in drinking water than in any other way. It was fully demonstrated during five years' residence in Beaufort county in this State. I bought a farm in Beaufort county, on the Pamlico river, about two miles below Bath creek. There were three wells on the place from which water was used by the occupants for all purposes. The wells were about ten feet deep. After taking possession of the place I learned from the neighbors that it was considered a very sickly place, and that the family which occupied it the year before (1869) lost five children during that year (which statement was correct) from fever. I had a good cistern built before I took my family there, which was in November, 1870. I carried my wife and four children there, lived there until January, 1876, when I left with six children and wife, all in good health. We had no serious sickness while there, and my doctor's bills did not average $10 per year, exclusive of midwifery fees (having two children born there). There was one death only during the five years, and that was a negro woman, who died of consumption. Besides my white family there were about twenty negro hands on the place, all of whom I required to use water for drinking and cooking from the cistern, which was a very large one. My neighbors had as much sickness as they had had before I went there, and it was constantly remarked by them that I had no sickness on my place.

"I have frequently heard Drs. McDonald and Taylor (both now dead) say that just after the war, in their practice in Washington, Beaufort county, when the citizens began to build cisterns the doctors' bills in the families who used cistern water decreased very much, and was very decided as soon as a family would make the change. I have heard Dr. John Blount, of Washington, who is now living, make the same statement."

Hon. W. D. Pruden, Edenton, Chowan county:

"My experience and observation have been most satisfactory and convincing of the good effect of cisterns upon the health of those who use them here. Prior to 1883 my family used water from an open well in my yard, which was carefully looked after, and was certainly equal to any other in the community. In 1883 I built a cistern, and we have constantly used water from it since, and I am satisfied that sickness in my family has been reduced one-half. There is no other cause for it known to me except the change in water. Malarial sickness with us now is rare. My neighbors who have used cistern water have, I believe, had a like experience. Cisterns have largely increased in our town, and the health of our people correspondingly improved.

"Many of our people use driven wells, which are also beneficial, though not as much so, I think, as cisterns. The pipe is small and largely excludes surface water."

Mr. I. M. Thompson, Southport, Brunswick county:

"I have been living in my present quarters thirty years, and have used cistern water, and have never had a case of fever in my family of nine grown children, while those in the house twenty feet from mine, and others on the same block, using pump water from pipes running down ten or fifteen feet, have attacks of malarial fever every summer. I was married to my present wife seven years ago. She weighed one hundred and twenty pounds, had always drunk shallow well or pump water, and was full of malaria, which developed into a case of fever soon after she came here. Since her system was cleared and she has been drinking cistern water she is perfectly healthy and weighs one hundred and seventy pounds.

"There are only four cisterns in this town, and to my knowledge there has never been a case of fever in any of the houses where they are. I am delighted that you are agitating the question, have always been interested in it, and hope your 'efforts to revolutionize the health records' will meet with success."

THOSE USING DRIVEN WELLS.

Hon. Thomas G. Skinner, Hertford, Perquimans county:

"I used spring and well water in my family up to the year 1887, and my medical account was large every year. Since then I have used water from a driven pump—forty-five feet deep—and we have no fever, and my doctor's bill is only nominal."

Mr. C. W. Morgan, Hertford, Perquimans county:

"I have been using water in my family from a driven pump thirty-eight feet under ground for nearly five years, and during that time we have had no malaria or chills in our family. I think the driven pump excellent for health in this malarial section."

Mr. Timothy Morgan, Hertford, Perquimans county:

"When driven pumps were first introduced into this section they proved a perfect failure, because no one thought of driving more than ten feet, and seldom that far. Of course that gave us the same water that our wells afforded, and, besides, the excavation made at the bottom of the pipe was constantly caving in and keeping water always muddy. I had always used well or spring water up to that time, and while I was very anxious to have a pump I saw no improvement save convenience. I therefore continued to use well water. I do not remember the exact time when I had my pump driven, nor could I give you any definite figure as to doctors' bills up to purchase of pump, but this I do know, that since I have been using it we have had little or no malarial sickness, and we prefer the water to any attainable here. I think I have been using pump about eight years. It is forty-seven feet deep. I would not be without it for ten times its cost."

Mr. M. H. White, Hertford, Perquimans county:

"In my opinion the driven wells have done more to benefit the health of this community than anything I have ever known."

Mr. George D. Newby, Hertford, Perquimans county:

"We have been using the driven wells about eight years, and think they have improved the health of this place (Hertford) at least 50 per cent. Before that time we used wells about eight or ten feet deep."

Mr. L. W. McMullan, Hertford, Perquimans county:

"From 1865 to 1884 I used water from surface wells from nine to twelve feet deep. My doctor's bill for that period averaged $100 per annum, mostly for malarial diseases. Since 1884 I have been using water from driven pump—forty-five feet deep—and during the ten years my doctor's bill has been less than $20 average per annum, and very little of that amount has been on account of sickness from malarial causes. It is exceedingly rare that any of my family (wife and four children) have had chills and fever since 1884. Before that time every member of the family had chills and fever often. I believe our improved health is due entirely to purer water."

Mr. Joseph White, Winfall, Perquimans county:

"We have used the driven well or pump in our town for five years, and since its use have realized a great *improvement in the health* of our town. I remember the year before I began the use of water from the pump, which is seventy-three feet deep, my doctor's bill was $100; since then, for four years, my medical bills have averaged from $15 to $20 per year, and but little of this expense accrued from malarial influence. I feel confident my pump—the use of its water—has saved me $150 in the last four years. All the doctors heartily recommend them."

Mr. Henry S. Bunn, Doehead, Edgecombe county:

"I have lived at my present home about twenty years, drinking water from a common well curbed with cypress gum to the depth of eighteen or twenty feet. This being a malarial country, chills were no strangers to us; but last winter and spring they came with unusual frequency and severity. I became suspicious of my well, and on June 8th last I put down a common iron pump, and since that time don't think we have had a regular malarial chill. Certain it is that there has been not to exceed forty grains of quinine taken by us from June 8th to date (August 26th), but for five months prior to that time we used one ounce of quinine a week. I think the change entirely due to the healthfulness of the water. The pump is invaluable in this section."

Mr. S. E. Thrower, Melrose, Robeson county:

"I have been here about twelve years, and had a well that I thought was good water, and my doctor's bill ranged from $10 to $25 every year. Our family doctor said the water was not good. I thought he was mistaken, but he told me to get a pump. I got one and drove it down thirteen years ago, and have not had a doctor since for malarial poison. I think a pump is the greatest thing on earth. Dr. W. J. Gilbert is the man that recommended the pump."

Mr. C. A. Holland, Maxton, Richmond County:

"Your circular-letter of August 1st received. I have been in the pump business here for eight years. Before the people began using pumps there was a great deal of chill and fever, but now since their introduction we rarely ever have a case of chill and fever. Dr. McNatt told me some time ago that in a section of country between here and Lumberton, where they had so much malaria several years ago, he rarely ever has a case, and he says he has no doubt it is the use of pumps that has caused the improvement in the health of this section. The doctors in this section all recommend pumps in preference to open wells."

FROM PHYSICIANS—UNFAVORABLE.

Dr. J. F. Miller, Superintendent Eastern Hospital, Goldsboro, N. C.:

"I, in common with many physicians, have held to your theory on the water question; but recently some experiences have upset or rather disagreed with my theory. For a year we have had a great deal of malarial fever, mostly of intermittent and remittent types, and I find those who use cistern water suffer about as much as those who drink well water. Our wells are, however, driven wells and not dug-out wells. Our well water was analyzed by Dr. Venable, of Chapel Hill, and pronounced O. K. It may be that we have malaria in spite of good water from all our sources, and this supports our theory to some extent. The lowlands bordering on Little and Neuse rivers are prolific in malarial fevers during most of our fall months; and the past August, September, October and November we had in this hospital among patients and their employees and their families nearly two hundred cases, many of them relapses; but from this cause we had no deaths."

FROM OTHERS THAN PHYSICIANS—UNFAVORABLE.

H. Wiswall, Winsteadville, Beaufort county:

"We have used cistern water and sometimes water from driven wells, never from the other wells. I cannot say that we have escaped the chills, but I do think that we have fared much better than others who use poorer water."

W. H. Johnston, Esq., Tarboro, Edgecombe county:

"Up to the time I attained the age of forty-three years I used water from ordinary wells, and since that time have used cistern water. I greatly prefer cistern water to the water we obtain from wells, and am sure it is more wholesome, but I suffered no more from malaria when I used well water. I was married at thirty-seven years of age, and my family used well water for six years and have since then used cistern water. I am now sixty-three years old. I cannot say that my doctor's bills for malarial diseases were greater when we used well water than when we used cistern water. I think they were about the same."

Mr. Frank E. Hitch, Hamilton, Martin county:

"I have lived in Bertie and Martin counties for more than twelve years, in close proximity to Roanoke river. I have a wife and five children. In that time there has been but one chill in my family. I had that at Nag's Head last summer. We have drunk well water all the time. No other family in this section has such a record as mine."

Mr. J. B. Bryan, Aurora, Beaufort county:

"Would say that cisterns are cheap and appreciated by our people. Am sorry to say that I am not certain that they add to the health of our people, but think they must."

In assigning to the evidence just cited its proper weight I am not unmindful that the conditions demanded by rigid scientific acuracy were not always present, but most of the letters are so clear, definite and positive as to be, to my mind, taken in connection with the evidence cited from other writers, absolutely conclusive of the fact that the malarial poison finds its way into the system largely—not to express it too strongly—through the medium of drinking water consisting solely of, or contaminated by, surface washings, or chiefly of superficial soil water. It is to be noted that water from *deep*, open wells, where the surface water had to percolate a long distance—where it was thoroughly filtered—was comparatively innocuous (see letter of Dr. Pierce). It is stated by a writer on this subject (Dr. Bartley, cited above) that he has demonstrated this fact with a Pasteur-Chamberland filter; and it is well known that enough of the right sort of mother earth is one of the best of all filters. I would also call special attention to the fact, as clearly shown by the evidence given, that there is no special virtue in a driven well *per se* beyond keeping out the surface washings, but that it is the *depth* to which it is driven that confers the virtue. Note the difference in the results obtained from the shallow-driven wells of Southport and Pensacola, Fla., not to mention others, and the deep-driven wells of Perquimans and the deep-bored wells of Franklin, Va., and south-west Georgia.

In order, if possible, to have this question of the part played by drinking water in the production of malarial diseases investigated on a large scale, with all the conditions necessary for scientific accuracy strictly complied with, I addressed the following letter to the able Superintendent of the Penitentiary, the Hon. A. Leazar:

"RALEIGH, N. C., May 5, 1894.

"*Hon. A. Leazar, Superintendent of State Prison, Raleigh, N. C.*,

"MY DEAR SIR:—Remembering the interest in the subject of the influence of drinking water in the causation of malarial diseases shown by you in our recent conversations on that line, I enclose a copy of a circular-letter which I have sent to every physician in the eastern part of our State. From the replies to it I hope to obtain ample evidence of such convincing character as to bring about good results.

"If you and your Board of Directors can see your way clear to undertake it, I am sure you can be of great help in making this investigation that the State Board of Health has begun. The fact that one of the State farms is very malarial, and the further fact that the population resident thereon, being prisoners, are under absolute control, combine to make conditions exceptionally favorable to reliable and trustworthy experimentation, which can, by no possibility, do any harm, but may be productive of the greatest good, not only to the convicts themselves directly, but indirectly to the people of a large part of our State. If you find that you can undertake the experiment, I would respectfully suggest:

"1. That you build a cistern for the collection of rain-water, and that you bore a well deep enough to get its water supply from beneath the stratum of impervious marl or clay.

"That the prisoners may be divided, as equally as may be practicable and convenient, into three squads. That each squad, being as far as possible under exactly the same conditions in other respects as the other two, be absolutely restricted to the use of one kind of water—the ordinary water now in use, the cistern, and the deep well-water, respectively.

"3. That if it be not already a routine practice—as it probably is—a full and accurate record of disease—malaria particularly—be kept from now on, in order to create a basis of comparison with a similar record after the change in drinking water.

"Bespeaking on the part of yourself and your Board of Directors a careful consideration of this matter, I am,

"Very truly yours,
"RICH'D H. LEWIS,
"*Secretary.*"

To this the following reply was received:

"NORTH CAROLINA STATE PENITENTIARY,
"RALEIGH, N. C., May 8, 1894.

"*Dr. R. H. Lewis,*

"MY DEAR SIR:—Yours of recent date, suggesting experiments by the Penitenitiary of cistern and deep well water, for the better sanitation of our convict camps, is received and duly considered.

"I hope soon, by the assistance of Dr. Holmes, State Geologist, to make some exploration as to the possibility of getting the deep water, and then, if successful, to adopt whatever plan seems most practicable and to promise the best results.

"I will refer your letter to the Board, which meets May 21st, for their consideration.

"With great respect, I am
"Yours truly,
"A. LEAZAR."

I also had a personal interview with Mr. A. B. Young, the energetic President of the Board. He showed much interest in the matter and promised to see what could be done.

Learning that driven wells had been tried on the State farms in Halifax, I wrote, enclosing circular-letter No. 2, to Drs. George H. West and H. B. Furgerson, physicians to the farms. Only one reply has been received, I regret to say, so far, and that not so full and detailed as it will be in the near future, as appears in the letter itself. It is quite instructive, however, as it is, and we may look forward with much interest to Dr. West's promised paper. The letter is as follows:

"WELDON, N. C., September 6, 1894.

"*Richard H. Lewis, M. D., Raleigh, N. C.,*

"MY DEAR DOCTOR:—Yours of the 5th to hand, and in reply would say that I am preparing an article for publication for the *North Carolina Medical Journal*, entitled 'Good Drinking Water *versus* Malaria,' but will not have it ready before October, as I want to include in my observations the month of September, as August and September are the unhealthiest months on Roanoke river; but I can give you a practical illustration of the result of using water from driven pumps for August. There has been an average of sixty-five hands (greatest number eighty) working on the dyke on the Roanoke river on Northampton State Farm, and I have had them to use exclusively water taken to them from the quarters two miles distant (driven pump), and during the entire month there was not a *single case* of intermittent fever among the force. This I consider the most unhealthy situation on the entire farm, and, to use an old Louisiana expression, the 'malaria is such that you can stir it with a stick or cut it with a knife.' During my twenty-three years' experience in the active practice of medicine, including a residence of six years on Red river, in northern Louisiana, I have been a great stickler for good drinking water, and I think the day is not far distant when the malarial dilemma will be solved by working up a public sentiment in favor of the use of good drinking water. I am fully aware that one swallow does not make a summer, but I am greatly encouraged in the line of work I am pursuing during my four months' residence as physician to State farms. If you wish I will contribute the article I have reference to to the *Bulletin*.

"Yours very truly,

"GEORGE H. WEST."

I am very much in hopes that the authorities of the Penitentiary may carry out in detail, on one of its farms at least, the experiment suggested in my letter to Superintendent Leazar. It would be extremely valuable and carry great weight in the scientific world.

While this investigation is not yet concluded, I believe the reader will agree with me that the case is practically made out, and that we may claim with certainty that the malarial poison finds its way into the human system through the medium of drinking water, and that in all probability it constitutes its principal avenue of access. Q. E. D.

Excluding malarial diseases, there is, in my deliberate opinion, no healthier country on earth than Eastern North Carolina. If the universal employment of pure drinking water in that section could be brought about, its health record would indeed be revolutionized, and that really splendid country would blossom as the rose.

POSTSCRIPT.

Since the above was published that admirable journal, the *Charleston News and Courier* has interested itself actively in the investigation of this question. Besides publishing most of the letters given above the editor has printed, with able comments on the same, a number from persons living in the malarious section of South Carolina. Some of them are so striking and so convincing that we feel that any one who has been interested enough to read this far will thank us for the opportunity of perusing them also. We therefore append pertinent extracts and desire to call attention especially to the letters of Mr. Emerson and Dr. Wilson.

[From Mr. J. R. Randall.]

* * * Yesterday I had an interview with Mr. Henry Yeatman, who, for a considerable period, resided in Princess Anne county, Virginia. The conditions there are just such as exist in your low country. Mr. Yeatman substantially said: "How many years of suffering I would have escaped had I known or had I become convinced, as I am now, that the fevers that scourged our country were produced by the surface well water and not by the atmosphere, as nearly everybody believed, including the doctors. I well remember how, more than forty years ago, the Rev. Mr. Gatewood, then a young man, was pitied for accepting a clerical charge in our afflicted community. He was a fearless man and confidently predicted that he would not get the prevailing diseases. Year after year he remained among us and was totally exempt from our maladies. Every year people shook their heads and said: "He has escaped this time, but wait until next year. He is bound to get fever, chills and chronic dysentery, like the rest of us." None of these ominous prophecies were fulfilled. At last some of the neighbors waited on him and asked him to tell them how he managed to keep perfectly well. He laughingly said: "I do not dring water. Neither do I drink any spirituous or malt liquors. I eat indiscriminately whatever I please—the same fare as yourselves. I drink coffee and tea, but never touch water." Of course he meant raw water, for he boiled it with his tea and coffee. To this day Mr. Gatewood, now an old man, abstains from raw water, and is a model of health. In the immediate vicinity of our swamps the people dwelling there knew that their shallow wells were dangerous. In every house a pot of water was always kept boiling in the fireplace. The people there made a kind of Yupon tea and drank of nothing else. They never had any fevers or consequential diseases. I see now that the boiled water alone, without the boiled Yupon ingredient, would have sufficed. I do not see how any man, with these and other kindred facts before him, can doubt for a moment that malaqua and not malaria is the bearer of zymotic disease.

[From "Med."]

This water question is understood and appreciated by all the inhabitants throughout this notoriously malarial region, for go wherever you will and ask if they have fever, and the invariable reply will be "Not much, or no, for we have good water," or "Yes, you see the water is not good."

A few years since, within the last five, the residents in and around Honey Hill in Berkeley county have adopted the use of driven wells in lieu of open wells eight or ten feet in depth, poor substitutes, you will admit, for artesian wells or cisterns. Although these pipes are driven only sixteen to eighteen feet, still the result is striking in the decrease of malarial diseases. At one locality, about three miles from the above mentioned village, at one time considered a "death hole," and from which a family "natives to the soil" had removed, another family, almost entirely strangers, had lived with comparative impunity for the last four years, using only water from a driven well. How much more effective would be perfectly pure water? I have no hesitation in saying that, irrespective of locality, the health of the residents is in direct ratio to the quality of the water. In rainy seasons the wells are generally filled with surface water, hence in such seasons we always have more fever hereabout; in dry seasons comparatively little. "MED."

ST. JAMES SANTEE, S. C., February 2, 1895.

[From X. Y. Z.]

* * * Prior to the use of artesian and cistern water the white employees of these mines were frequent victims of malaria in its various forms, whether sleeping at the neighboring pine land or at the health-giving resort, Summerville, and notwithstanding the use of quinine.

Since the building of cisterns and the boring of wells about 375 feet deep, and the exclusive use of those waters, the same individuals who before suffered have been exempted from malarial troubles, even those most exposed to such influences, superintending the digging of rock in rain or heat or cold.

I have had but one attack of fever in nine years and that resulted from getting wet in a summer storm while crossing the river, and having to remain in the wet clothing until I reached the city. I always avoided the use of spring or surface water, going without or using milk as a pleasant substitute when to be had, until cistern water was available. We have hunted here in August (the "stands" in dense swamps), early in the morning before the dew and mists had been dissipated by the sun, and escaped fever, shunning surface water.

So convinced are we all here of the benefit arising from the exclusive use of cistern or artesian water that a bottle of one or the other is carried on every hunt, even though a flask of something stronger accompanies it "to keep off snake bites." One young gentleman has slept at these mines the entire summer without suffering from malaria, and he not a stranger to the low country, nor yet acclimated to swampy regions.

The physicians and scientists may draw their own conclusions; I have no theories to advance, simply state facts. X. Y. Z.

Of course in the above I refer to serious attacks of fever.

MAGNOLIA MINES, ASHLEY RIVER, February 1, 1895.

[From C. J. M.]

TO THE EDITOR OF THE NEWS AND COURIER:—I have been reading with much interest the articles which have appeared lately in the *News and Courier* on the subject of drinking water and malaria. My experience with driven pumps in the river bottoms may be of interest.

In 1884 I bought a river place to go into the stock business, and as it was necessary to be on the place I moved into the swamp. My friends all advised against it and predicted that I would not be able to live there. I put down a driven pump twenty-five or thirty feet and for five years lived on the place, winter and summer, and enjoyed the very best of health the whole time, and now my friends say that I have exploded the idea of river bottoms being unhealthy. It is impossible to get pure water from a well anywhere, but particularly in the swamps; but with driven pumps it can be obtained in any locality, and that renders the bottom lands of the Pee Dee river perfectly healthy. * * * C. J. M.

MONT CLARE, S. C., February 7, 1895.

[From Mr. Emerson.]

* * * We have lying around us a rich and fertile country which is practically uninhabited. Why? Simply because the cry is, "Do not go into the country; if you do you will die of country fever!" The result is that strangers coming into the city do not dare be caught outside its limits after sundown for fear of catching some dreadful disease that will kill them in a few hours or days. During the last four years I have spent quite a number of nights traveling all night through the swamps and sickly sections of Berkeley county during the months of June, July, August and September for the purpose of deciding the question in my own mind whether the air had anything to do with the fever or not. Others have tried the experiment with me and none of them have had any symptoms of malaria. Not only myself and wife, but my brother and his wife and two children have slept all through the summer months with all windows open, and a free circulation of air passing through our sleeping apartments. I have exposed myself to all kinds of weather, have been out before day in the bushes and tall grasses, and have been soaked through from dews every morning during the hot season. I have had my Northern friends spend from a week to two months with me during the hot season, and in no case have they shown any symptoms of malaria.

As regards the air arising from the swamps one of "S's" so-called healthy places is nearer to swamps and stagnant water than my place is. I would not for the whole of Berkeley county spend a summer in any one of the places he mentioned and drink the surface water there. A look at the residents is sufficient. It is easy to see that the germ is doing its work, not to such an extent as it would if they lived on the plantation, because the quality of the surface water in the pine land is superior to the quality of the surface water that they would get on the plantation. The soils of pine lands being of a sandy nature, the water filters through it and partially purifies itself before reaching the wells, whereas the plantation soil is of a clayey nature, and the water does not so readily penetrate it. It washes, therefore, directly into the well, carrying with it all the germs it has gathered on its course. The drier the season the more healthy the pine land. This comes from the water being better in the dry season than it is in the wet season. After the cyclone and the heavy rains following in August of 1893, and again after the heavy rains in September, last year, I visited one of these pine land "summer resorts," and found the wells all full and overflowing, with almost every resident down with malarial fever.

No city has ever experienced permanent prosperity that did not have a healthy and prosperous country surrounding it. It is not my purpose to criticise or condemn any person or place, but to do all in my power to help to build up the country, and I feel that I cannot accomplish my purpose by crying "wolf."

At a public meeting held at Eutawville a few days ago I offered to give $5,000 to any man that would prove that a case of fever had originated on my place during my stay there of the last four years. An objection was raised that I might say the person had drunk water obtained elsewhere. I then offered and I now repeat the offer to give $5,000 to any man, who has no malaria in his system, who will come to my place and spend six months, or ten years, if he develops malarial fever, provided he drinks no surface water.

I am honest in my conviction. I have tested it until I am thoroughly satisfied myself. Now I am willing to spend more money and time, and to help in any way possible to assist in settling the question to the satisfaction of honest doubters to silence those who seem to be happiest when they are crying loudest against their own country.

I am a strong believer in the South; it is my adopted home; my interests are here. During the time I have spent here I have induced a large amount of capital to invest here and expect to induce a great deal more, but it is not my purpose to deceive or mislead any one. I am willing, therefore, to join hands with my opponents on this issue, and secure the best qualified and equipped men for the purpose and have them come into our country and make a thorough test and experiment and settle the whole question.

It is a question of vital importance to us all and we should have it settled right away, and so undo the injury that has been done to this region in the past. If it can be proved that the country is absolutely healthy and that "malarial fever" can be avoided by drinking pure water and pure milk and paying proper attention to the sanitary conditions of their surroundings, we should prove it. With these facts established, as I am thoroughly convinced they will be established, a movement could be put on foot to bring into Berkeley county in the next two years twenty thousand good, thrifty, intelligent, industrious farmers, who would produce vegetables enough to run a hundred canning factories; potatoes enough to run as many more starch factories.

I have traveled the United States all over, have made an investigation of the matter, and believe there is no better soil and no better climate than we have here; and no better country provided we can keep ghosts from appearing to us at every turn.

Are we to continue to travel the road we are now on, which is a deplorable one indeed, or will we seek to leave it and take the road to prosperity and success? I for one have not the time or disposition to linger longer in the old one, but am determined to seek and find the new one. Who will go with me?

A. S. EMERSON.

CHARLESTON, January 29, 1895.

[From Dr. Wilson.]

JORDAN, CLARENDON COUNTY, February 11, 1895.

TO THE EDITOR OF THE NEWS AND COURIER:—I have read with a good deal of interest the discussion on "Malaria or Malaqua," and will give you the benefit of my experience the past summer and fall.

My work is on the Santee, and I had a great deal of intermittents. I found that when I required my patients to boil the water they drank I relieved them promptly of chills; otherwise the cases were extremely obstinate.

The excessive rains caused large quantities of water to lie on the low places. I drank water from a well and continued to have the chills in spite of the most powerful anti-malarial remedies known to materia medica. I drove a pump and stopped all medicines and had no more chills.

This naturally makes me a strong advocate of the water theory.

Yours respectfully,

H. L. WILSON, M. D.

No comment (says the editor) that we could make would add to the force of this testimony. Dr. Wilson, it is seen, goes farther than any one else who has testified on the subject, in that he testifies that he has *cured* chills in his own case by simply substituting good water for bad. He drank surface water, and took the most powerful anti-malarial remedies known, and "continued to have chills." He "drove a pump," "stopped *all* medicine," and "had no more chills." It would be hard to put evidence and argument in any stronger form than *that*.

ADDENDUM.

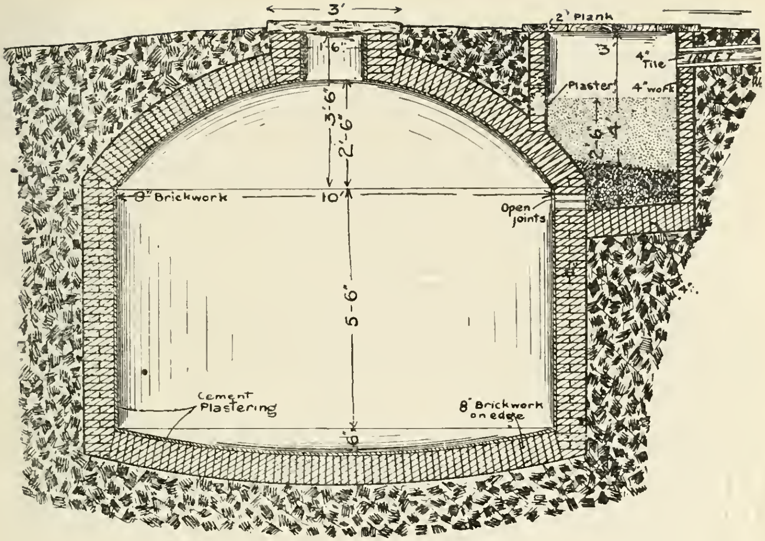
SUGGESTIONS AND INSTRUCTIONS FOR BUILDING CISTERNS FOR THE STORAGE OF RAIN-WATER.

BY J. C. CHASE, ENGINEER OF THE BOARD.

The most satisfactory form for an underground cistern for storing rain-water is circular in plan, covered with a dome arch ten or twelve feet in diameter and of the required depth to store the desired quantity. The smallest size that is usually constructed contains one hundred barrels, or thirty-one hundred gallons. This quantity would furnish an average daily supply of fifteen gallons for a period of six months. It is considered advisable to have the cistern full by April 1st, and have it of sufficient capacity to last till the fall rains set in; therefore the size will depend upon the prospective consumption, whether it is used merely to store water for drinking and cooking or is expected to furnish a supply for general uses about the premises, such as washing, watering stock, etc. In the latter case it would be better to provide two cisterns—one of which could be used for storage as the rains occurred and the other be reserved for household use.

The method of construction is shown in the accompanying drawing, and little additional explanation will be necessary. Care should be taken that the bottom be built on compact material, also that the earth is thoroughly packed around the outside of the structure. If built in hard material, such as stiff, dry clay, it may be practicable to make the excavation just enough larger to allow for a course of hydraulic cement mortar between the brick-work and the earth. The brick may be laid in lime mortar, but in that case it will be necessary to thoroughly plaster the structure both outside and in with a good coating of hydraulic cement mortar. The inside should be well and smoothly plastered in any event. The mortar for plastering should be made of pure cement.

The supply pipe from the roof should have the customary valve (Fig. 3) for wasting the rain-fall until the roof is thoroughly washed, and also after the cistern is full. The water should also be filtered through sand and gravel, from which the loam has been washed out, or charcoal, or a mixture of all three, before passing into the cistern. The same general method should be followed in constructing the filter as has been detailed for the cistern. The filter should be thoroughly cleaned out and the material washed each year. It is also desirable to clean the cistern, but



Sectional Elevation

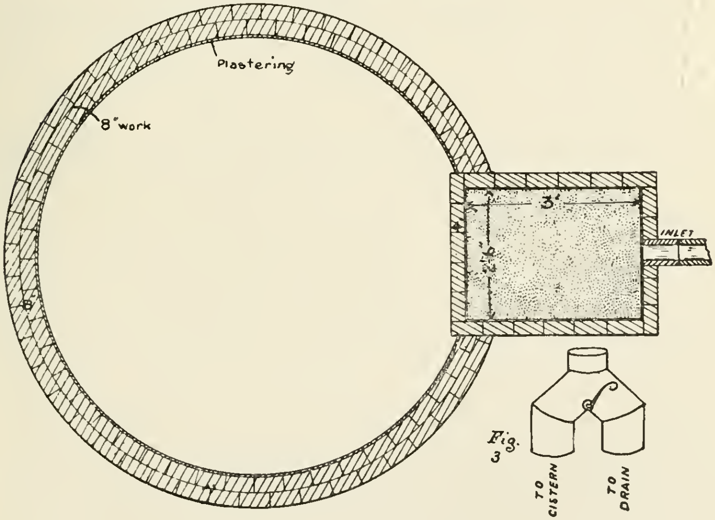


Fig. 3

Sectional Plan.

if the filter has proper care it will not be essential to do it each year. Care should be taken to close all apertures in the cistern in such a manner that vermin, ground water leachings, or any other impurities will be positively excluded. The roots of certain kinds of trees have a great propensity to seek water, and will find their way through brick-work if there is the smallest crevice to give them a chance to force an entrance.

Cisterns are sometimes built partially or wholly above ground; also rectangular in form with vertical sides and covered with a circular arch. The filter is also frequently built above ground and at a distance from the cistern, the water being conducted thereto in a duct made of brick or by iron or earthen pipe. Great care should be taken in laying this conduit to see that the joints are made perfectly tight.

Chain pumps are frequently used for drawing water from cisterns and have the advantage of thoroughly aerating the water, but as they are necessarily placed directly over the cistern and require a large opening to be made the danger of contamination from foreign substances getting into the water is greatly increased.

The following is a fair estimate of the cost of a cistern of the size shown on the plan, where the prices of materials are the same as those quoted:

Three and one-half thousand bricks	at $8.00	$28 00
Four barrels lime	at 1.25	5 00
Three barrels cement	at 3.00	9 00
Labor excavating, bricklaying, preparing filter with covers, etc		30 00
Total		$72 00

The cost of larger ones would be somewhat less in proportion to the size.

After this paper had been read, Dr. Bahnson said: "Following out the plan outlined this morning, I will say that this is a perfectly informal meeting, and we would be glad to have all participate in it, and to ask any questions that you feel disposed to ask."

Gentleman in the audience: "Mr. Chairman, I have observed that you all seem to believe that malaria gets into your system through water. Now, in my county here there are a large number of citizens who believe that it is necessary for you to put something into your system to keep the malaria out. You know that we are afflicted with a large number of distilleries here, and I would like to have the Board tell us whether alcohol used moderately or immoderately will put the system into a condition that makes it easy to take malaria or not."

Dr. Battle: "There was a very interesting experiment tried in India some years ago. A regiment of soldiers going through the same campaign was divided into four companies, with a view to telling the effect of the grog ration upon the system; not only grog, but with a view to telling how coffee and tea and water affected the human system. One part of the regiment was put on pure water; a second was put on tea; a third on coffee, and a fourth was put on an alcohol ration. It was not a very fair experiment in some respects, as India is such a very unhealthy country, but the water quarter came out last; the tea people came out first; the coffee people came out second, and the alcohol people came out third. That is to say, tea gave the best results, coffee gave the second best, alcohol gave the third best, and water gave the poorest results. There is little doubt in my mind that a moderate amount of coffee and a moderate amount of tea and a moderate amount of alcohol does tend to protect the system against malarial poison. Of course the trouble is in putting on the brakes. The people in the tropics who take their coffee in the morning are less liable to take the malaria than those who just use the water. If we keep the veins full of good stimulant we are less liable to open wide the door to any malaria. Well, that about answers the question so far as I know."

Dr. Bahnson: "The question is asked whether it is possible to take malaria from ice gathered from ponds where malaria exists. It is not only possible, but it is certain."

Gentleman in the audience: "A day or two ago I saw something in the paper that was very amazing to me: that water after standing several hours was more wholesome than if it was freshly drawn. I would like to hear some explanation of that."

Dr. Thomas: "One of the things that is always understood in regard to the water supplies of cities is that the water should not only be filtered, but that sufficient time should be given for sedimentation, so that all coarser particles, I mean those that can be seen without the microscope, will have time to settle."

Gentleman in the audience: "I would like to ask Dr. Battle whether the fact that the tea and coffee were boiled did not have something to do with the difference, and also whether the water was boiled or not?"

Dr. Battle: "I don't remember that the water was boiled, but of course the tea and coffee were boiled, but I think that tea and coffee are both very healthy, when taken in moderation. There is hardly a doubt but that the bulk of humanity is benefited by the use of tea and coffee. Of course it is the abuse that brings about the nervous disorders, just as it is with alcohol. I think the experience with alcohol has shown that the human frame cannot stand over one ounce of alcohol a day without injury. But as I have said about the tea and coffee, certainly those people who take in the morning that form of beverage have better health and are less liable to malarial influences."

Gentleman in the audience: "Mr. Chairman, I would like to know if you can give us a simple remedy for testing the water in our wells. It is a recognized fact that some wells have water as clear as a crystal, and as cold as ice, and yet the water is impure. Now we would like to have some means of testing the water in our wells to see whether it is pure or not."

Dr. Bahnson: "You can't tell that by any ordinary means, because the water may taste bad and smell bad, and yet the worst tasting and smelling water may be perfectly harmless as far as we are concerned."

Gentleman in the audience: "In 1872, in Memphis, there was a certain man whose duty it was to go all over the city and order all the wells cleaned out. He would go around and get a bottle full of the water, test it, and the next morning he would tell the owner of that well whether he must have his well cleaned out or not."

Dr. Bahnson: "The next paper on the programme was to have been read by Dr. Venable. We are sorry to say that Dr. Venable was prevented from attending on account of sickness in his family. The subject of his paper was 'The Pollution of Drinking Water and its Detection,' and therefore we will have to substitute the following paper entitled 'Household Water Supply,' by Mr. J. C. Chase, the Engineer of the Board, also unavoidably absent. Dr. Thomas will please read it":

HOUSEHOLD WATER SUPPLY.

BY J. C. CHASE, WILMINGTON, SANITARY ENGINEER OF THE BOARD.

The importance of an ample supply of wholesome water for general use is so universally understood and admitted that it may seem a waste of time to dwell upon the subject. It is corroborated by the fact that, at the present time, none but the smallest cities are lacking a public water supply. Less than a generation ago the largest city of our State had hardly dreamed of water-works, while to-day no less than fourteen municipalities have public water supplies, satisfactory, perhaps, in point of capacity, but some of them of more or less doubtful quality when the question of purity is considered. In using the term *pure* I do not wish to be understood as saying that absolutely *pure* water is desired or expected. Such water, if in existence at all, can be found only in the laboratory of the chemist, and its use would be impracticable even if it was considered essential. A standard of purity has, however, been established for the information of those interested in such matters, and the guidance of those who are intrusted with the selection of sources of supply. The sensible requirements of potable water are that it should be colorless, odorless and tasteless.

A plentiful supply of wholesome water for the household is a vital necessity. It should be *soft*, on account of its being better adapted for lavatory purposes, as well as for economic reasons; the difference in the amount of soap required by a hard water, as compared with a soft one, is no inconsiderable item in the ordinary household expenditure.

Wells and springs are the most common source of supply for the household in the majority of places. Such waters are generally of a fair degree of purity. They are naturally inclined to be hard on account of taking up a certain amount of mineral matter from the earth, but if the well is deep and at a considerable distance from the dwelling, with the surface drainage from the well towards the house rather than the opposite, it may be safe to assume that the well will be reasonably free from organic contamination, or the specific germ of disease. With the ordinary shallow well, in porous soil, and in close proximity to dwellings or farm buildings, it is more than likely that the water derived therefrom is totally unfit for domestic use. It may be palatable, for even sewage contaminated water presents a bright and sparkling appearance, and the fact that no sickness has appeared in the family for a long time, if ever, may be advanced as evidence that the good quality of the water cannot be discredited, but in spite of all this there is death in the type of well I have described, and in the fullness of time the conditions will be ripe for a visit from the gaunt forms of disease and death. The danger cannot be overestimated of any open well, and particularly of this kind, becoming infected with the specific germ of that much to be dreaded malady, typhoid fever, and in this manner spread sickness and death where little expected. The last report of the Massachusetts State Board of Health notes an epidemic of typhoid fever caused by the use of contaminated milk. The laborers in a field which had been fertilized with the contents of a privy that had received the *excreta* of a typhoid patient were in the habit of visiting a certain well and, apparently, some of the filth from their boots had been deposited upon the loose plank covering of the well, which was used as a cooling receptable for cans of milk designed for distribution to customers at a later period. It is stated that the cans were submerged in the water, instead of being suspended in the usual manner, and that a leakage took place about the wooden stopper of the can, but any explanation or theorizing as to how *water* finds its way into *milk* would appear to be unnecessary.

In many localities in our State it is perhaps possible to obtain a supply from a spring situated at some distance from the house and at such an elevation as to deliver by gravity to the place of use. If the spring is deep-seated it will be safe to assume that it is and will remain free from pollution. Whether it is adapted to household use or not, on account of inorganic impurities, can be quite easily determined and will be most prominently indicated by the hardness of the water.

It is hardly necessary to say that the prospective proximity to the spring of dwellings or tilled fields may have a detrimental effect that should be carefully guarded against. Eternal vigilance is the price of a perpetually wholesome supply of water.

A water supply from running streams hardly merits consideration in this connection, on account of the limited extent it is likely to be used for ordinary household purposes. In general it may be said that a large stream with swift current flowing from a practically uninhabited territory will furnish water of satisfactory quality. The presence of cities on its banks, using it as a drain to receive their sewage and other wastes, would virtually condemn the water without a hearing. The smaller the stream the more suspicious the water will naturally become, and the small creeks and branches would hardly be considered as having any claims worthy of attention unless the surroundings were of an unexceptionable nature.

We may sum it all up by saying that it almost entirely depends upon the local conditions of the water-shed whether the water of a stream can be used with safety for domestic consumption. If a sparsely settled region, where the soil is cultivated to a limited extent only, the organic impurity will naturally be comparatively small and of vegetable origin. Still such supplies require to be zealously guarded to insure absolute freedom from danger, as witness the terrible epidemic of typhoid fever at Plymouth, Pa., a few years ago. The *excreta* of a typhoid patient some miles from the city had been thrown out on the snow, and the spring thaws had carried it into the mountain stream from which a part of the city derived its supply. The water had been of undoubted purity, coming as it did from a sparsely settled mountainous region, and it was a long time before any suspicion of the true cause of the epidemic was entertained. The part of the town getting its supply from a river of rather doubtful quality entirely escaped the epidemic. This fact, however, should not lead us to put our trust in water supplies of suspicious character, but rather to exercise strict watchfulness over the source of supply, however high its rank as a wholesome water, or however free it may appear to be from prospective contamination. The case I have just referred to is a striking example of the danger of a good supply being polluted by a specific germ of disease.

In some localities in our State a plentiful supply of water of satisfactory quality may be had from what are known as driven wells; that is, pipes perforated at the point and driven into the ground to the proper depth, the pump being attached to the surface end of the pipe. Of course this type of well presupposes that the mass of earth above the water-bearing stratum is virtually nothing but sand, and where the locality is thickly settled the chances are that the water will be contaminated with organic impurities leaching down from above. These waters are generally cool, of a fair degree of softness and well adapted for household use. In a sparsely settled locality it is quite probable that the surface impurities would be so small in quantity that they would be eliminated before reaching the ground water level, the sandy stratum acting as a filter of the intermittent type, which the very elaborate and extensive experiments of the Massachusetts State Board of Health have shown to be the kind of filter best adapted for the purification of water contaminated with organic wastes.

Artesian wells—that is, wells deriving their supply from beneath impervious strata—are of such infrequent use in our State that little need be said in regard to them. They generally yield a water reasonably free from organic contamination, but with an excess of inorganic impurity. I do not think it unfair to assume that the majority of artesian wells yield water that is only considered fit for use because no other that is better can be had, to say nothing about those that no stretch of the imagination could credit with supplying potable water.

Rain-water stored in tanks or underground cisterns—preferably the latter—is the most available and satisfactory source of supply in many localities, particularly where the ground water is of an excessive degree of hardness, and running streams of suitable quality are not available.

Rain-water is the softest natural water found, and at a distance from large cities, or after there has been a sufficient fall to clear the atmosphere of the many impurities contained therein, is of undoubted purity.

It is not so palatable, however, as spring or river waters on account of its freedom from mineral matter and lack of aeration, and for this reason would be considered flat and insipid by one accustomed to the waters above mentioned. To maintain the natural standard of purity in the water it is necessary that the cistern be properly constructed in the first place, and due care taken to keep it, with its various appliances, in good order. It should be built in an accessible place, and conveniently arranged for examination and cleansing. The custom of placing it under some building cannot be too strongly condemned. The pump should be at some distance, so that any waste water from various household avocations, that are frequently carried on at the pump, will not be likely to get into the cistern through any possible defects in the original construction. No water should be admitted to the cistern until the roof has had a thorough washing off, especially after a prolonged season of dry weather, and the water should pass through a suitable filtering device. It is also considered advisable to store the rain-fall of the winter months only; and with all of the precautions above mentioned it is very desirable that the cistern should have a thorough cleansing each year. I am aware that the precautions I have outlined are more often honored in the breach rather than the observance, but it is only by the frequent reiteration of sanitary truths that we can get a reasonable amount of attention given to them, and it is very fortunate that the human organization is no more susceptible than it is to the insidious attack of disease.

I have not touched upon the matter of determining the amount of pollution in prospective sources of supply, as that properly belongs to the province of the water analyst. I have little confidence in the reliability of the results of various popular "home-made" methods. Suffice it to say that the State has made suitable provisions for doing such service for its citizens, and no reasonable excuse exists for any one remaining in ignorance of the true character of their water supply. It is proper to say, however, that the old idea that one analysis is sufficient to determine the character of a prospective supply is no longer tenable. It is now well understood that frequent analyses, extending over a period of several years, are necessary in order to express a positive opinion on the subject, and even then it is highly desirable that a careful watch should be kept up continuously.

I am fully aware that nothing new has been presented for the consideration of the majority of those present, but the simplest of truths are only inculcated by frequent iteration, and if this paper aids in the slightest degree to the development of a more enlightened state of affairs relating to one of nature's greatest needs, the writer will feel well repaid for the time he has spent in preparing this brief paper.

The President then said: "Ladies and gentlemen, this finishes our afternoon session. The meeting will begin to-night at 8 o'clock at the same place. The ladies are especially invited."

The meeting then adjourned at 5 o'clock.

NIGHT SESSION.

The meeting was called to order at 8:30 o'clock by the temporary chairman, Dr. George Thomas, of Wilmington, in the absence of Dr. Bahnson, who had to leave the city.

The first paper, entitled "The Importance of Disinfecting the Bowel Discharges in Typhoid Fever," was read by Dr. Wilson, Superintendent of Health of Guilford county:

THE IMPORTANCE OF DISINFECTING THE BOWEL DISCHARGES IN TYPHOID FEVER.

BY ALBERT R. WILSON, M. D., OF GREENSBORO, N. C., SUPERINTENDENT OF HEALTH OF GUILFORD COUNTY.

Mr. President, Ladies and Gentlemen:

Those of you who had the good fortune to listen to the comprehensive, practical and lucid paper of Dr. Thomas during the forenoon will have recalled to your minds by this paper many of the facts stated by him. However, the subject is so important that I deem it unnecessary to apologize for repeating them.

The importance of typhoid fever as a disease dangerous to the public health is recognized by all physicians who have given sufficient thought to its cause and the modes of its conveyance; but I am sure that this subject has not yet received at the hands of the profession generally the time and study which it deserves. If this be true as to the profession, then we can at once arrive at the conclusion that the public general has not the knowledge concerning this disease and its prevention which it should have. It is a disease which prevails widely in all temperate climates. Some idea may be gained of its prevalence in North Carolina when you are told that there has not been a month within a year, dating from the first of August, 1893, to the first of August, 1894, in which typhoid fever has not been reported from at least 13 counties. Beginning with the September *Bulletin*, 46 counties reported typhoid fever, 54 in October, 51 in November, 47 in December, 24 in January, 19 in February, 13 in (each) March, April and May, 40 in June, 50 in July and 66 in August. You can see clearly that the disease has been continually with us for a year, and I doubt not that the reports for previous years would show it to have been present *all* the time in some one or other of the sections of our State.

When you are told or reminded of the fact that those between the ages of fifteen and thirty years are most susceptible to this disease (although none are exempt from infancy to old age), and when you take into consideration that this is the most important and the most active part of man's life, then count the cost of sickness, death and burial and loss of time from labor and school resulting from it in the aggregate, and when you are acquainted with the fact that from each case of this disease an epidemic might have its inception, thereby striking down from 5 to 1,000 persons, you can readily see what an important relation it bears to the public health.

Now, if by any means typhoid fever could be prevented, or even restricted, what a stupendous amount of suffering, sorrow, loss of time and labor would be saved, and in its stead would prevail health, happiness and prosperity! Typhoid fever is a preventable disease, and in one instance, at least, experience has demonstrated that it can be practically wiped out. When a doctor speaks of a disease becoming epidemic the people at once want to know what causes it and by what means it is conveyed. We can spend a few moments profitably in considering this cause and how it produces epidemics. It is believed by the best authorities upon the subject that there is a specific germ which causes typhoid fever, while yet there are others who do not. Typhoid fever is an infectious disease; if an infectious disease, then there must be an infective agent, and it has been proven that this agent, call it by whatever name you may, is always present in the intestinal canal of those sick of typhoid fever, and that it is present also in the discharges of these patients, and furthermore that it has the power of reproducing itself outside of the human body. It is believed, and this belief is borne out by the observation and studies of some of the brightest and most logical minds in the medical profession to-day, that this infective agent, found constantly in the intestinal canal and in the discharges of typhoid fever patients, is the cause which produces the disease. By what means does this cause gain entrance into our bodies? Some authorities believe it to be feebly contagious, and that nurses attending typhoid patients, handling the bed and body linen and the discharges without proper precaution, contract the disease. Epidemics of this disease have been caused by persons drinking milk contaminated by the typhoid germ. This may be brought about by the addition of infected water to milk for adulteration, or by washing the vessels used to contain the milk in infected water. Again, the cause is said to gain entrance into the system by the inhalation of particles of dust or air contaminated by it. The most common means by which the cause is conveyed and gains entrance into our bodies is through drinking water which is infected. Reservoirs of towns or cities may be infected and thus cause wide-spread epidemics. Wells may be polluted by drainage into them of infected surface water. Springs, also, by having the discharges containing the infective agent washed into them by rains, or by percolation through the soil to the source of their water supply.

I will relate to you the details of an epidemic caused by contamination of a spring which came under my observation this summer. Six miles north of Greensboro is a chapel, near which is a sluggish spring, situated at the bottom of a basin formed by surrounding hills. From the lay of the hill-side forming this basin matter thrown on the ground at one point will be washed by rains directly in the spring or deposited in porous soil quite near it. If the matter be placed upon the hill-side at another point the drainage will not be directly into the spring, but whatever is washed down will be deposited above and about the spring. Situated near the top of one of the hills forming this basin is a cabin in which lived Mr. S—— and family, consisting of his wife, two sons and a young baby. This spring supplied the water for this family and the chapel. Mrs. S—— was taken sick on May 2d, and went to bed with fever June 17th.

Dr. Schenck was called to see the family. Mrs. S—— was then in the beginning of convalescence, and from the history she gave the doctor concluded she had been sick with typhoid fever, which conclusion was proven to be correct by the sequel. Upon investigation it was found that the discharges from this patient were thrown upon the ground at both the points mentioned, though most of them were deposited where the drainage would carry them directly into the spring for the space of three weeks. Between the 10th and 20th of May there were frequent rains. The husband and two sons were sick with typhoid fever on June 17th, all three having been taken sick about the 8th or 10th of the month. A. S——, a niece, had been nursing her aunt, Mrs. S——, and had the premonitory symptoms of fever at the doctor's first visit, and was advised by him to return home, which she did. June 23d she was sick with typhoid fever. On the 25th M——, a sister of A. S——, was attacked by fever. She had also been nursing her aunt. A. R—— attended service at the chapel during the week ending June 27th, and drank water from this spring. On the 2d or 3d of July he was stricken down by fever. L. J—— also attended services at the chapel during the same week and drank this spring water. On the 9th she was also sick of typhoid fever. M. L—— visited Mrs. S—— often during her sickness and drank water from the spring. The 20th of June found her in bed with typhoid fever.

Let us review this evidence hurriedly. There was a case of typhoid fever; the infected discharges thrown out upon the ground at points from which they could be washed directly into the spring or quite near to it; rains to wash these discharges into and about the spring. Next, two young persons attending services at the chapel soon after these rains, and drinking water from the spring, were taken sick with typhoid fever. About the same time three members of the family using water from this spring were stricken with the disease. Next in order is a lady visitor to the house, who says she drank the water, and she, too, had fever. Finally, the two sisters who had nursed their aunt and drank the water were the last to sicken with the disease.

The chain of evidence submitted to you to prove that drinking water infected by typhoid discharges will produce an epidemic of this disease, I think, is complete. A notable epidemic which I will merely mention was that which occurred at Plymouth, Pa , in 1885, caused by the discharges from one case of this fever.

How can typhoid fever be prevented or restricted is a question of great importance to us all, not only as individuals and families and communities, but it is of such moment that it interests us as a State and nation. The question will be answered by simply telling you to disinfect the discharges. If we had pure water, good sewers, good drainage, clean towns and clean homes, there would be less of this disease, certainly. This cannot be so as long as the typhoid discharges are thrown out undisinfected and the infective agent allowed to propagate and drain into and pollute our water supply. You can see that all efforts tending to protect ourselves, our towns and cities by supplying good water, keeping clean homes and providing good sewers are all subservient to the one vital point—the disinfection of the discharges. You have seen how one case could infect a spring and cause several cases; so one case could produce a thousand under favorable conditions, as was the case in the striking epidemic at Plymouth, where 1,000 were stricken and over 100 deaths occurred. Had the discharges in each of the cases cited been thoroughly disinfected and properly disposed of these epidemics would have been averted. Recall to mind that each case may and can, under favorable conditions, produce an epidemic, and then think how prevalent the disease is and how little is done toward its prevention, and it is easy to see how liable we are to epidemics. What are disinfectants, and how can they be used effectively? A disinfectant is "an agent capable of destroying the effective power of infectious material." The destruction must be thorough, for so long as there is vitality in the infective agent it will reproduce itself; therefore try to do thoroughly whatever is attempted in the way of disinfection. Bichloride of mercury or corrosive sublimate, chloride of lime and milk of lime or whitewash are the disinfectants recommended to us by our State Board of Health for the disinfection of discharges. There are other disinfectants, but these have been chosen for their effectiveness, cheapness and because, with proper care, any one can use them.

There is a distinction which I wish to call to your attention, and that is the difference between a deodorizer and a disinfectant. Copperas is a deodorizer, one of the best, but it has been proven by experiment that a saturated solution of this substance does not "destroy the infective power of infectious material." It is commonly used as a disinfectant, but as such, in the sense of the definition of disinfectant as given, it is useless, but as a deodorizer it is to be valued. Bichloride of mercury is to be used in solution in the proportion of two drachms to the gallon of water. This solution should be colored on account of its poisonous properties. The solution of chloride of lime is made by dissolving six ounces of it while fresh in a gallon of pure water. This solution should be prepared as needed. Milk of lime or whitewash is made by reducing to powder one quart of quick lime by the addition to it of one quart of water, then adding to the powder three quarts more of water. Store in a tight vessel till needed. Be sure your whitewash is fresh when you use it, and to insure this make a new supply every few days. To disinfect the discharges place at least a quart of either of these solutions in the vessel intended to receive the discharges, and see to it that the evacuation is well mixed with the disinfecting solution, and allow the mixture to stand from a half hour to an hour before emptying it into the water-closet or burying it, as the case may be. Preferably, in disposing of the discharges by burial, seek to place them, if possible, where the soil will not likely be disturbed by upturning, not upon a hill side, and certainly not within 100 feet of any water supply. These are practically the directions laid down by our Board of Health, and if properly carried out, along with subservient measures, typhoid fever will eventually be removed from our land. In the preparation of this paper I have availed myself of, and drawn upon, the best authorities at my command. In presenting it I have tried to set before you the important relation typhoid fever bears to the public health; to tell you what is believed to be the cause of the disease; by what means it is conveyed into our bodies and how epidemics are produced by it; and finally, what is meant by disinfectants, and how to use some of them.

Much more could have been said upon each phase of the subject as presented, but if it has awakened an interest in or stimulated a desire to know more about the subject, or convinced any one of the great importance of disinfecting the discharges in this disease, it has accomplished good.

Dr. Thomas: "I hope that this meeting will be participated in by the audience: that they will ask questions when they don't understand and I am sure that Dr. Wilson will be pleased to answer any questions that he can."

Dr. Lewis: "I have been asked by our esteemed member, and your valued citizen, Dr. Whitehead, to explain the Plymouth epidemic, which Dr. Wilson referred to in his excellent paper. Plymouth is a town of 10,000 inhabitants, on the Susquehanna river. The main water supply was from a beautiful mountain stream, the water-shed of which was covered entirely with woods, and on that water-shed there were two small huts. In the month of February a man who was a relative of the family occupying one of these huts went there on a visit from Philadelphia. The ground was frozen solid and there was snow on the ground six feet deep at the time. Soon after he got there he had typhoid fever. His bowel discharges, undisinfected, were thrown out on the snow. He improved, but relapsed, and the consequence was that his case continued for a long time. On account of the freeze the people had to use water from the Susquehanna river and from wells in the town. The water of the Susquehanna river was very ordinary water, to say the least, and the wells in the town were, according to chemical examination, simply villainous. On the 26th day of March came the spring thaw. The snow melted; the usual water supply of the town was replenished, and again used. Now this water, chemically pure, but contaminated with the typhoid fever bacilli, was turned into the town on the 26th day of March. On the 10th of April, or fourteen days after (the incubative period of typhoid fever), the first case of the disease broke out in a family immediately below the dam, who probably drank of the seepage: and within three months there were over one thousand cases of typhoid fever: and before the end of the year more than one thousand one hundred, in a population of ten thousand. There was that single case of typhoid fever; the ground covered six feet with snow; and that one single case, owing to the negligence or probably ignorance of the people living in that hut, was the cause of this terrible epidemic and over one hundred deaths. If the evacuations had been disinfected, with little trouble and practically no expense, all that sickness and those deaths would have been prevented. Now this is a very important object-lesson, and I hope you will bear it in mind. Any one that will not disinfect the bowel discharges of typhoid fever is, to say the least, criminally negligent. Every householder who has in his family a case of typhoid fever, and who fails to follow the instructions of his physician in this respect, is liable to a fine. He ought to be liable to a fine and imprisonment; but the practical difficulty is to punish anybody for this negligence, for the reason that the people are all so indifferent on the subject. If a case of fever or any contagious disease was in your neighbor's family, and your wife or children, through the negligence of your neighbor, were to catch this disease and die from it, how would you feel about it? I am sure that you would be very indignant, to say the least. You would feel that he ought to be punished for such negligence; and I think that it should be a law of the State that if any person should lose his life through the criminal carelessness of another the person guilty of such carelessness should be liable to his estate in a money fine. It is a sad commentary on human nature, but whether sad or not it is true, that if you can convince a man that he is going to lose money if he neglects a certain thing, he will not neglect it; but if you preach to him from now until doomsday that he is going to lose his life, or the life of his wife or child, then he will say 'Oh, this is some of your absurd theory; I will attend to it next week,' etc, but never does. We hope that we will make an impression upon you in regard to this matter, and we want you to think about it, and believe in it, and act upon it. It is simply incalculable the amount of good that would be accomplished in the long run."

Dr. Thomas: "If any one wishes to ask any questions we will be glad to answer them if we can."

Dr. Whitehead: "Mr. Chairman, the town of Salisbury receives its water supply from two sources—from wells and from the water-works; in other words, the water from the creek, which is used very much by the citizens here. The creek flows thirty-six miles through a clean country, and it receives a good many branches before it reaches down here. The creek is a pretty bold, free creek. The water is filtered through the American Filter, which is composed of finely packed sand. I have never seen a chemical analysis of the water after it comes through the filter: but if there is anything the matter with the filter we get the 'reverent stuff.' The superintendent of the water-works is in the audience, and he is able to give you a fuller account of this water than I am. As far as the wells are concerned the town is becoming more densely populated. and the time is coming when we will have to give up the wells. I think from what I know of the water that it is very good water, and I think the water supply of Salisbury will rank very favorably with the water supplies of the other towns; but the superintendent is present, and he will be able to give you a much fuller description of our water than I can."

Mr. Neeve, Superintendent of the Water-works: "Our source of supply is about thirty-six miles long, and it is supplied, as Dr. Whitehead said, by branches on both sides, and the water for about nine months in the year is very good, clear water; but during the season when the fields are ploughed up and the heavy rains come we have pretty muddy water. We have an American Filter, composed of about five and one-half feet of sand, and the water is filtered through that by pressure, and we also use alum. We always try to get pure water, but owing to accidents sometimes the filter gets out of order; and we have had to have some little muddy water, but as a rule we have very clear water."

Dr. Thomas: "Are there many people living along this creek?" "No, sir, not very many. It is very thinly settled."

Dr. Lewis: "Mr. Neeve, I would like to ask if there are any mill-ponds along this creek?" "Yes, sir; there is one."

Dr. Lewis: "How far is it from the reservoir?" "About five miles."

Dr. Whitehead: "There is one important point that Mr. Neeve has not stated; and that is that whenever he hears of any case of typhoid fever in that section he goes to the house and has the necessary precautions taken; but as he has not referred to it I think that, in justice to him, something ought to be said about it."

Dr. Whitehead: "The quantity of the water used by the town will about consume the quantity pumped into the town every day, will it not, Mr. Neeve?" "Yes, sir; we pump just what is used during the day—about 350,000 gallons a day. There is no surplus."

Dr. Lewis then explained the establishment of the waterworks in Raleigh; about the difficulties they had in getting the Board of Aldermen to seek the advice of the County Board of Health before making the contract. Dr. Lewis wound up his remarks by saying that he thought the water supply of Salisbury was in a fairly satisfactory condition, and that, in his opinion, it was much safer than the ordinary wells of the town.

There being no more business before the Board, the chairman of the meeting arose and said: "We greatly regret, ladies and gentlemen, that the Board of Health is going to part with you. I assure you that we have been exceedingly cheered by your presence. It is the most encouraging sign that I have ever seen to have the women take an interest in these meetings, as they have the care of the household and the children. I therefore say that we feel especially thankful that this visit has impressed itself upon the women; and I feel sure that if we leave any impression on them the sanitary condition of this good old town will be improved."

The meeting then adjourned at 9:30 o'clock.

SIXTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH.

1895-1896.

WINSTON:
M. I. & J. C. STEWART, PUBLIC PRINTERS AND BINDERS.
1897.

SIXTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH.

1895-1896.

WINSTON:
M. I. & J. C. STEWART, PUBLIC PRINTERS AND BINDERS.
1897.

MEMBERS OF THE BOARD.

ELECTED BY THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

George Gillett Thomas, M. D., President............Wilmington.
Term Expires 1897.

S. Westray Battle, M. D..Asheville.
Term Expires 1897.

W. H. Harrell, M. D...Williamston.
Term Expires 1897.

John Whitehead, M. D..Salisbury.
Term Expires 1897.

APPOINTED BY THE GOVERNOR.

W. P. Beall, M. D..Greensboro.
Term Expires 1897.

W. J. Lumsden, M. D..Elizabeth City.
Term Expires 1897.

F. P. Venable, Ph. D., F. C. S....................................Chapel Hill.
Term Expires 1897.

John C. Chase, Sanitary Engineer................................Wilmington.
Term Expires 1897.

Richard H. Lewis, M. D., Secretary.........................Raleigh.
Term Expires 1897.

STANDING COMMITTEES.

Epidemics—Drs. Lewis and Whitehead.

Water Supply and Drainage—Dr. Thomas and Mr. Chase.

Hygienics of Public Schools—Drs. Whitehead and Lumsden.

Climatology—Dr. S. W. Battle.

Adulteration of Food and Medicines—Prof. F. P. Venable.

Sanitary Condition of State Institutions—Drs. Harrell and Beall.

Vital Statistics—Drs. Lewis, Thomas and Harrell.

LIST OF COUNTY SUPERINTENDENTS OF HEALTH IN THE STATE OF NORTH CAROLINA, DECEMBER 31, 1896.

Alamance—Dr. R. A. Freeman, Burlington.
Alexander—Dr. T. F. Stevenson, Taylorsville.
Alleghany—Dr. Robert Thompson, Sparta.
Anson—Dr. E. S. Ashe, Wadesboro.
Ashe—Dr. L. C. Gentry, Jefferson.
Beaufort—Dr. Joshua Tayloe, Washington.
Bertie—Dr. H. V. Dunstan, Windsor.
Bladen—Dr. Newton Robinson, Elizabethtown.
Brunswick—Dr. D. I. Watson, Southport.
Buncombe—Dr. E. C. Starnes, Asheville.
Burke—Dr. J. L. Laxton, Morganton.
Cabarrus—Dr. Robert S. Young, Concord.
Caldwell—Dr. A. A. Kent, Lenoir.
Camden—
Carteret—Dr. George N. Ennet, Beaufort.
Caswell—Dr. W. O. Spencer, Yanceyville.
Catawba—Dr. D. McD. Yount, Newton.
Chatham—Dr. J. Baxter Matthews, Pittsboro.
Cherokee—Dr. J. F. Abernathy, Murphy.
Chowan—Dr. R. H. Winborne, Rockyhock.
Clay—Dr. W. E. Sanderson, Hayesville.
Cleveland—Dr. O. P. Gardner, Shelby.
Columbus—Dr. I. Jackson, Whiteville.
Craven—Dr. J. W. Duguid, Newbern.
Cumberland—Dr. J. Vance McGougan, Fayetteville.
Currituck—
Dare—Dr. W. B. Fearing, Manteo.
Davidson—Dr. John Thames, Lexington.
Davie—Dr. James McGuire, Mocksville.
Duplin—Dr. J. C. Grady, Magnolia.
Durham—Dr. John M. Manning, Durham.
Edgecombe—Dr. L. L. Staton, Tarboro.
Forsyth—Dr. E. F. Strickland, Bethania.
Franklin—Dr. E. S. Foster, Louisburg.
Gaston—Dr. J. H. Jenkins, Dallas.
Gates—
Graham—
Granville—Dr. T. L. Booth, Oxford.
Greene—Dr. Jos. E. Grimsley, Snow Hill.
Guilford—Dr. W. J. Richardson, Greensboro.

Halifax—Dr. I. E. Green, Weldon.
Harnett—
Haywood—Dr. J. Howell Way, Waynesville.
Henderson—
Hertford—Dr. John W. Tayloe, Union.
Hyde—
Iredell—Dr. W. J. Hill, Statesville.
Jackson—Dr. W. F. Tompkins, Webster.
Johnston—Dr. R. J. Noble, Selma.
Jones—
Lenoir—Dr. James W. Parrott, Kinston,
Lincoln—Dr. Thomas F. Costner, Lincolnton.
Macon—Dr. S. H. Lyle, Franklin.
Madison—Dr. James K. Hardwicke, Marshall.
Martin—Dr. W. H. Harrell, Williamston.
McDowell—Dr. George I. White, Marion.
Mecklenburg—Dr. H. M. Wilder, Charlotte.
Mitchell—Dr. C. E. Smith, Bakersville.
Montgomery—Dr. W. A. Simmons, Troy.
Moore—Dr. Gilbert McLeod, Carthage.
Nash—Dr. J. J. Mann, Nashville.
New Hanover—Dr. J. C. Shepard, Wilmington.
Northampton—Dr. H. W. Lewis, Jackson.
Onslow—Dr. E. L. Cox, Jacksonville.
Orange—Dr. D. C. Parris, Hillsboro.
Pamlico—
Pasquotank—Dr. J. E. Wood, Elizabeth City.
Pender—Dr. George F. Lucas, Currie.
Perquimans—Dr. C. C. Winslow, Winfall.
Person—Dr. J. A. Wise, Roxboro.
Pitt—Dr. Frank W. Brown, Greenville.
Polk—Dr. C. J. Kenworthy, Tryon.
Randolph—Dr. T. T. Ferree, Ashboro.
Richmond—Dr. W. H. Steele, Rockingham.
Robeson—Dr. T. A. Norment, Jr., Lumberton.
Rockingham—Dr. D. W. Courts, Reidsville.
Rowan—Dr. John Whitehead, Salisbury.
Rutherford—Dr. E. B. Harris, Rutherfordton.
Sampson—Dr. John A. Stevens, Clinton.
Stanly—Dr. D. P. Whitley, Millingport.
Stokes—Dr. W. L. McCanless, Danbury.
Surry—Dr. John R. Woltz, Dobson.
Swain—Dr. A. M. Bennett, Bryson City.
Transylvania—Dr. M. M. King, Brevard.
Tyrrell—Dr. B. W. Cohn, Columbia.

UNION—Dr. J. E. Ashcraft, Monroe.
VANCE—Dr. J. H. Tucker, Henderson.
WAKE—Dr. P. E. Hines, Raleigh.
WARREN—Dr. Geo. A. Foote, Warrenton.
WASHINGTON—
WATAUGA—Dr. W. B. Councill, Boone.
WAYNE—Dr. W. J. Jones, Jr., Goldsboro.
WILKES—Dr. J. M. Turner, Wilkesboro.
WILSON—Dr. Nathan Anderson, Wilson.
YADKIN—Dr. T. R. Harding, Yadkinville.
YANCEY—Dr. J. L. Ray, Burnsville.

LETTER OF TRANSMISSION.

North Carolina Board of Health,
Office of the Secretary,
Raleigh, N. C., January 7, 1897.

His Excellency Elias Carr,
Governor of North Carolina,

Sir:—In accordance with Section 3, Chapter 214, Laws of 1893, I have the honor to present this the Sixth Biennial Report of the North Carolina Board of Health.

With great respect,
Your obedient servant,
RICHARD H. LEWIS, M. D.,
Secretary and Treasurer.

SIXTH BIENNIAL REPORT

OF THE

NORTH CAROLINA BOARD OF HEALTH.

1895-1896.

During the past biennial period the State has been greatly blessed in its escape from any serious or widespread epidemic of disease. As an illustration we cite the fact that not a single case of small-pox has occurred within our borders, notwithstanding its prevalence in many widely scattered localities in the United States. We deserve no credit for this, however, for unfortunately the people as a whole are most discouragingly indifferent to the importance of vaccination. As a consequence thousands—hundreds of thousands, we may say—of our people are unprotected and present a rich harvest for that particular messenger of death, should it come to us, as it may at any hour, and in the course of time surely will. But the Board of Health is powerless, beyond offering advice, which in the absence of imminent danger goes unheeded, for the reason that under the law it has only advisory powers and cannot compel obedience to the plainest and most urgent sanitary rules. Owing to this want of power our work has been for the last two years, as in the past, chiefly educational. Our efforts have been directed to instructing the people in the principles of hygiene and impressing upon them the importance and value, looked at from the money point of view as well as from that of life and comfort, of a proper observance of the rules of health. This work has been accomplished through the instrumentality of letters from the Secretary in particular cases, the *Monthly Bulletin*, health conferences, and the distribution of health pamphlets. Two "health conferences with the people" have been held since our last report, one at Washington on the 16th of November, 1895, and the other at Charlotte on October 15, 1896. These were well attended, especially the former, at which people were turned away for want of room. Much interest in the proceedings, which consisted of the reading of papers, by members of the Board and others invited by the Board, of a popular character on practical subjects, the discussion of the matters thus brought forward and ques tions by individuals in the audience. Nearly 30,000 each of three health pamphlets and 20,000 of another have been distributed. By these means sanitary seed have been sown broadcast from Cherokee to Currituck, and although many fell by the wayside or on stony ground or among thorns, some have fallen on good ground and brought forth fruit. While we cannot claim to have yet secured a good "stand" the field grows greener with each succeeding year and the prospect of a harvest more encouraging.

A detailed statement of the work of the Board since our last report will be found in the following pages.

MEETINGS OF THE BOARD.

CALLED MEETING AT RALEIGH,

January 29, 1895.

In the absence of a quorum an informal consultation by the three members present, viz.: Drs. Thomas, Harrell and Venable, besides the Secretary, was held with the last named in regard to sanitary legislation by the General Assembly then in session.

MINUTES OF THE ANNUAL MEETING AT GOLDSBORO, IN 1895.

GOLDSBORO, N. C., May 15, 1895.

The Board met in annual session. Present, President Thomas, Drs. Harrell and Venable, and the Secretary. The minutes of the last meeting were read and approved.

The term of the President having expired, Dr. George Gillett Thomas was unanimously re-elected.

Upon invitation Drs. Albert Anderson and W. T. Pate, who had completed the course in practical bacteriology at the laboratory of the United States Marine Hospital service under Passed Assistant Surgeon, J. J. Kinyoun—this privilege having been extended to them by the Board upon the offer of the Marine Hospital service—appeared before the meeting. The question as to the best arrangement to be made between them and the Board in regard to bacteriological examinations was mutually discussed. It was finally decided that they should provide all their apparatus and that the Board would pay them for work done. They were requested to submit a schedule of charges.

Upon motion the secretary was instructed in view of the absence of a quorum to submit a copy of the proceedings of this meeting to the absent members by letter for their approval or disapproval.

On motion Washington was selected as the place for holding the next health conference in October, the exact date to be set by the President.

On motion two hundred dollars per annum were appropriated for clerical help to the Secretary.

On motion the action of the Secretary in having 10,000 copies of "Instructions for Quarantine and Disinfection" printed for distribution with the other health pamphlets was endorsed.

On motion the Secretary was instructed to have printed in pamphlet form the paper on "Typhoid Fever" read by Dr. A. R. Wilson, of Greensboro, before the Salisbury Health Conference, together with the section of the law bearing on that disease, for general distribution.

On motion the Secretary was authorized to have printed as many copies of the several health pamphlets as in his judgment could be distributed to advantage.

The Treasurer, on motion, was given permission to send his report by mail to the auditing committee, composed of Drs. Venable and Harrell.

On motion the Board adjourned.

RICHARD H. LEWIS,
Secretary.

In compliance with the instructions above given the following letter was sent to all the members of the Board who were not present at the meeting, and their replies unanimously approving the action taken by those present are on file in the Secretary's office.

NORTH CAROLINA BOARD OF HEALTH,
RALEIGH, October 21, 1895.

DEAR DOCTOR:—At the Goldsboro meeting, on May 15th, it was moved that in view of the fact of a want of a quorum, the Secretary be instructed to submit by letter a copy of these proceedings to the absent members of the Board for their approval or disapproval, in order to make effective any action that may be taken.

Drs. Thomas, Harrell, Venable and the Secretary were present. Anderson and Pate appeared before the Board by invitation, and the best arrangement as to bacteriological work by them for the Board was discussed. It was decided to pay them for the work done, and they were requested to submit to the Board a schedule of charges. Dr. G. G. Thomas was unanimously re-elected President. Washington was selected as the place for the next Health Conference, the date in October to be set by the President. On motion it was ordered that $200 per annum be appropriated for clerical help to the Secretary. The action of the Secretary in having printed 10,000 copies of instructions for quarantine and disinfection for distribution with the other health pamphlets was approved. He was instructed to have printed for general distribution Dr. A. R. Wilson's paper on "The Importance of Disinfecting the Bowel Discharges in Typhoid Fever." He was also authorized to have printed as many additional copies of all the pamphlets as he might think advisable. The Treasurer was given permission to send his report by mail to the auditing committee, composed of Drs. Harrell and Venable.

Please let me have your report on the above by return mail and oblige.

Yours very truly,
RICH'D H. LEWIS,
Secretary.

MINUTES OF THE MEETING AT WASHINGTON, NOVEMBER 6, 1895.

HOTEL NICHOLSON,
WASHINGTON, N. C., November 6, 1895.

After the adjournment of the Health Conference, which was a pronounced success, the Board met in private session. Present, Drs. Harrell and Venable, Mr. Chase and the Secretary. In the absence of the President Dr. Harrell was called to the chair. There being no quorum no formal business was transacted, but a general discussion of future work for the Board was had. Dr. Harrell handed in the Treasurer's report, approved by himself and Dr. Venable, the auditing committee.

RICH'D H. LEWIS,
Secretary.

MINUTES OF THE ANNUAL MEETING AT WINSTON IN 1896.

PHŒNIX HOTEL, WINSTON, N. C., May 12, 1896.

The annual meeting was called to order by President Thomas. Present, Drs. Thomas, Battle, Harrell, Lumsden, Venable and Lewis—and Dr. P. L. Murphy of the State Hospital by invitation.

On motion the reading of the minutes of the last meeting was postponed.

The question of the best place for the next health conference coming up, Charlotte was selected—the time to be set by the Secretary after conference with the President of the Board and the local physicians.

On motion it was decided to have made during the year, by committees to be appointed by the President, an inspection of all the public institutions and convict camps.

The advisability of quarantining measles was discussed. It was decided that it would be wisest not to attempt to enforce it.

The subject of further distribution of health pamphlets was considered but no action taken.

The care of the incurable insane of the State was likewise discussed at considerable length.

On motion the Board adjourned to meet again to-morrow.

RICHARD H. LEWIS,
Secretary.

Phœnix Hotel, Winston, N. C., May 13, 1896.

Pursuant to adjournment last evening the Board met, with Dr. Harrell presiding, in the temporary absence of the President. The President coming in resumed the chair. Present, Drs. Thomas, Harrell, Whitehead, Venable, Lumsden and Lewis.

On motion another edition of the present health pamphlets, together with Dr. Venable's paper on "Impurities in Drinking Water," Mr. Chase's on "Sanitary Drainage and Disposal of Household Wastes" and the paper on "The Care of the Eyes and Ears," written some years ago at the request of the Board by the present Secretary and stereotyped at that time by the then Secretary, Dr. Wood, of 20,000 or more copies in the discretion of the Secretary, was ordered printed, bound in one volume and distributed.

On motion it was ordered that a chemical and bacteriological examination be made of the public municipal water supplies of the State. Dr. Venable kindly offered to make for the Board one chemical analysis of each supply. The question of having an examination made of the water supplies of the public institutions was discussed, and left for decision to the visiting committees.

On motion Dr. P. L. Murphy, Superintendent of the State Hospital at Morganton, was requested to prepare and read before the proposed health conference at Charlotte a popular article on the importance and best method of caring for the incurable insane of the State.

The Secretary and another member of the Board, to be appointed by the President, were selected as delegates to the annual meeting of the American Public Health Association at Buffalo in September.

Dr. Venable, who was appointed a committee to audit the accounts of the Treasurer, reported them correct.

On motion the Board adjourned to meet at Charlotte.

RICHARD H. LEWIS,
Secretary,

MINUTES OF THE MEETING AT CHARLOTTE IN OCTOBER, 1896.

CHARLOTTE, N. C., October 15, 1896.

In one of the intervals between the meetings of the Health Conference a business meeting of the Board was held in the Buford House. All the members, except Dr. Harrell, who was detained at home by sickness in his family, were present. Passed Assistant Surgeon J. J. Kinyoun, of the Marine Hospital Service, and Dr. Murphy, of the State Hospital at Morganton, were also present by invitation.

The Secretary presented the reports of Drs. Anderson and Pate, the bacteriologists of the Board, of their examinations of the water supplies of Asheville, Salisbury, Concord, Greensboro, Salem, Winston, Durham, Raleigh, Henderson, Goldsboro, Wilmington and Newbern, and stated that he had been unable to obtain, up to that time, through the usual channels, proper samples from Charlotte and Fayetteville. He called attention to the fact that five of these supplies were reported as infected with intestinal bacilli and three as being suspicious.

On motion, the Secretary was instructed to have made immediately another bacteriological and chemical examination of all the infected and suspicious waters; and he was further ordered in those cases where the water was shown to be still bad, to notify the Superintendent of Health, the Mayor and the Manager of the Water Works of the fact, and call upon them in the interest of the public health to remedy the trouble, and if he did not receive satisfactory assurances within 30 days that this had been done, to have the analyses published in the local papers for the information of the people using said waters.

An offer to the Board by Dr. R. H. Whitehead, the head of the Medical Department of the State University, to make free of charge the serum diagnosis test for typhoid fever for physicians desiring it, was presented. On motion, Dr. Whitehead's kind offer was accepted with thanks, and the Secretary authorized to distribute the necessary information among the profession of the State, to make it effective.

A letter from Dr. Munroe, asking that the Engineer of the Board be sent to Davidson College to advise as to the best disposal of the sewage from the new medical building there was read. On motion, Mr. Chase was requested to visit Davidson and give all sanitary advice that might be indicated. He was also requested to make a sanitary inspection of the Orphan Asylum at Oxford.

Resolutions of thanks to Dr. Kinyoun for his interesting address on "Bacteria" to the Conference, and to Dr. Murphy for his excellent paper on the "Care of the Insane," were adopted. On motion, the Secretary was instructed to have 5,000 copies of the latter printed and distributed for the information of the people on this important subject.

On motion, the Board adjourned.

RICH'D H. LEWIS,
Secretary.

PROCEEDINGS

OF THE

CONJOINT SESSIONS OF THE STATE BOARD OF HEALTH

WITH THE

State Medical Society in 1895 and 1896.

The Conjoint Session at Goldsboro, May 15, 1895.

The Conjoint Session was called to order at 12 o'clock by the President, Dr. Geo. G. Thomas, of Wilmington.

The President stated that the expiration of the terms of Dr. W. H. Harrell, of Williamston, and Dr. John Whitehead, of Salisbury, made it necessary to go into an election for members to fill their places.

Dr. W. H. Harrell, of Williamston, and Dr. John Whitehead, of Salisbury, were unanimously elected to succeed themselves in office.

Dr. R. H. Lewis, the Secretary, read his report.

ANNUAL REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH FOR THE YEAR 1894–'95.

The law of the State requires the Secretary of the Board of Health to make biennially to the General Assembly, through the Governor, a report of their work. He is also required by the Board to make to its conjoint session with the State Medical Society an annual report. As the General Assembly and the Society do not meet at the same time the periods embraced in these reports are not synchronous, and the result is that the biennial report overlaps and includes a large part of the report which is made to you in odd years. In consequence of this fact the report of our work for the period embraced between our last meeting and January 1, 1895, has already been published in the Fifth Biennial Report to the General Assembly, copies of which you will find on the desk of the Secretary of the Society.

Since the first of the current calendar year comparatively little new work has been undertaken. With a Legislature dominated by a new element in our State politics whose attitude towards the public institutions in general, and the Board of Health in particular, was unknown, it was thought to be wisest to pursue a Fabian policy, lest our being too much in evidence might bring disaster upon the labor of years. It is extremely gratifying to be able to say that our fears proved to be entirely groundless. This matter having already been set forth in the Report of the Committee on Legislation no farther reference to it is required.

The most successful and in every way encouraging meeting the Board has ever held was that "with the people" at the Salisbury Health Conference in September last. A full account of the proceedings will be found in the appendix to the Biennial Report. Among the papers read on that occasion were, one entitled "Suggestions on the Prevention of Tuberculosis as We Know it To-day," by Dr. S. Westray Battle, of the Board, and another on "Drinking Water in its Relation to Malarial Diseases," by the Secretary. These papers were ordered by the Board to be published in pamphlet form for general distribution, and I had 10,000 copies of each printed from the type already set up for the Biennial Report. Feeling that the people needed instruction in regard to the importance of quarantine and disinfection in contagious diseases as well as in the matters of tuberculosis and malaria, and that we should take advantage of the opportunity to widely spread such information at a trifling cost, I took the responsibility of having the same number of "Instructions for Quarantine and Disinfection" reprinted. I began the distribution by sending a set of the pamphlets to all newspapers in the State with the following letter:

> Dear Sir:—I send you by this mail, under separate cover, copies of two pamphlets published by the Board for general distribution entitled "Suggestions on the Prevention of Tuberculosis as we Know it To day," and "Drinking Water in its Relation to Malarial Diseases." If they meet with your approval I would thank you to notice them in your paper, and especially to notify your readers that I would be very glad to send them just as many copies as they will read or agree to distribute among their neighbors. The widest distribution possible of these publications is desired. Anything you can do to help the Board in their work of preventing disease will be highly appreciated by them and by,
>
> Yours very truly,
>
> R. H. LEWIS, M. D., *Secretary.*

Not having access to most of the papers I cannot tell to what extent the request was complied with, but a number containing the desired notice have been sent me, and no doubt many others were equally kind.

In order to extend as much as possible the distribution I prepared and had printed 10,000 copies of a circular letter to our physicians.

With a view to an accurate distribution I returned to the Clerks of Court of all the counties in the State for revisal and correction in the lists of registered physicians kindly sent me by them in response to my request two years ago. All have been sent back except thirteen. To every registered physician in the other 83 counties I have mailed a copy of each of the three pamphlets and the circular letter, and will mail them to those in the other thirteen as soon as the lists, for which I have written again, come in. To all County Superintendents I have sent them in quantity, and also to those who have written for them with a promise to distribute them. In order to insure the thorough dissemination of the information on all the subjects treated of in the three pamphlets I have enclosed in each large package a copy of this circular letter:

> DEAR SIR:—I send you a number of copies of "Prevention of Tuberculosis as we Know it To-day," "Drinking Water in its Relation to Malarial Diseases," "Instructions for Quarantine and Disinfection," and circular letter for distribution. As the Board desires to disseminate the information contained in each as widely as possible among the people I would thank you to give to each person a complete set of all four. Although a person may express a desire for only one, give him all of them.
>
> If you find you can distribute more let me know and I will take much pleasure in replenishing your stock. Any efforts to help us in this work would be greatly appreciated by the Board.
>
> Very truly yours,
> RICHARD H. LEWIS, M. D, *Secretary.*

That the publications have been received with much favor is evident from the newspaper notices, which some of you have doubtless seen, and still more from the number of applications which I have received for them in response to the circular letter, and the invitation published in many of the newspapers, perhaps all of them. The exact number asked for so far in the applications which give figures is 4,093, varying in quantity from 1 to "300 or more." In addition 22 requests of an indefinite character have come in, such as, for example, "a few," "some," "a great many," "as many as you may please to send," "as many as you can spare," "enough to supply the drug stores of Fayetteville," "a sufficient quantity for a crowd of a thousand expected at the closing exercises of a school," etc. The ten thousand have been already nearly exhausted and the present demand has not by any means been supplied. I believe that 50,000 could be scattered through the State with benefit for the education of the people in these practical sanitary questions. Something on typhoid fever should accompany the publications mentioned above. We already have it in hand in an admirable article on that subject read before the Salisbury Health Conference by Dr. A. R. Wilson, the live and energetic Superintendent of Guilford County, which you will find in the proceedings of that meeting printed in the appendix to the Biennial Report. With the sections of the law especially applying to typhoid fever as an addendum that paper would I am sure do much good. I trust that it may be the pleasure of the Board to order it printed in the same form and sent out with the others hereafter.

If it meet with the approval of the Board it is my intention to send these pamphlets to all the State and County officers, to the professors in all our colleges and high schools, to every lawyer, especially to every preacher, that he may be incited to preach in private to his flock the gospel of physical health, to leading farmers and merchants and to every one who shall ask for them. But after all no class of our citizens can advance the cause of preventive medicine as can our physicians, for the simple reason that they alone can speak *ex cathedra.* It is, however, a very discouraging fact that many are quite indifferent to the claims of this branch of our calling, and I avail myself of the opportunity afforded by this conjoint session to again appeal to you to lend a hand and help to build up in the profession generally a sentiment favorable to the active promotion of that which has in it such potentialities for good to all the people. We have received gratifying assurances from various sources that the work done in the past year has been the most successful in the history of the Board of Health. With the cordial support and active co-operation of the medical men of the State we can confidently look forward to far greater results. Without it our best directed and most earnest efforts must prove largely barren and unprofitable.

It will be remembered that the U. S. Marine Hospital Service, through Passed Assistant Surgeon J. J. Kinyoun extended an invitation to our Board at the last annual meeting, at Greensboro, to send representatives to Washington for the purpose of receiving free a six weeks course of instruction in practical sanitary biology, in the laboratory of the Service.

I am gratified to report that Dr. Albert Anderson, of Wilson, and Dr. W. T. Pate, of Gibson Station, applied for the privilege, and in January last availed themselves of it. They report a very satisfactory experience, and are now fully equal to the bacteriological examinations called for in practical sanitation. They desire to make some return for the privilege enjoyed through the courtesy of our Board by doing a reasonable amount of work for us without charge. Dr. J. Howell Way, of Waynesville, has recently made application to the Board for an appointment to the Laboratory, and as soon as it may mutually suit the convenience of himself and the Superintendent of the Laboratory it will be given him.

The invitation is open to any member of the Society as long as the offer of the Marine Hospital Service in this matter stands.

DISCUSSION.

Dr. Haigh said that in his section of country there had been a great deal of interest taken in sanitation, and especially in regard to the supply of water. Of late years the malarial cases had assumed a more serious form, that of hemorrhagic fever. The simple driven pump is not having the full effect expected, that is, not giving freedom from surface water. He wished all the information he could get upon the subject. He had never seen the people take more interest in matters coming from the State Board of Health. He was sure that the profession would help the Board in every way in distributing these tracts.

Dr. Booth was glad that the Board was holding meetings round through the State, and he thought that the Board was doing a great work.

The report of the Secretary was received.

Dr. Geo. H. West presented, through the Secretary, a paper on the "Influence of Water on Malarial Fever." It was read by title and referred.

The Secretary stated that Dr. West reported his experience as a physician to the convict camps on the Roanoke river. He had found a marked difference in the amount of malaria caused from the driven pump and the open well. The desire is to get through the impervious layer of marl and clay; but he had found the malaria very much diminished by wells 25 or 30 feet deep, tho' not through the marl or clay. The Secretary reported a letter he had gotten from Dr. Whitaker, the County Superintendent of Jones county, of Trenton. Dr. Whitaker said in his letter that Trenton was situated on a ridge, with the river on one side and a mill-pond on the other. The people on the ridge rarely ever suffered from malarial troubles, but there was one well on the slope—the people who drank from it suffered very much from malarial diseases. The dam of the pond broke in the spring and was not repaired until the following fall, and the bottom of that pond lay exposed to the suns of that summer on the South side of the town during the entire season, and there was no increase whatever in the amount of malaria in the town. Dr. Whitaker himself and others fished in the little pools without the slightest hesitation and never had any malarial fever. He said that afterwards something got the matter with the mill and the owner turned off the water in order to repair his mill, and the consequence was deep indignation on the part of the people of Trenton; but, instead of an increase in the amount of malaria during that August and September, if there was any difference at all, there was less than there was before.

The President reported a series of cases from Jacksonville, N. C., bearing upon this question. The town is practically enclosed by New River; it is in Onslow county. On the point of this peninsula is situated a large sawmilling plant. These patients (all young men), having been warned of the dangers, had used Apollinaris and other bottled spring waters. All of the water was absolutely protected, but they had frequent and severe attacks of malaria. He suggested to these young men that, in addition to the care they exercised, they insist upon their cook boiling every day the water used in cooking their food that came from a well outside 140 feet deep. It went down through the mud layer and the layer of sand and layer of clay. So far the experiment of boiling the water has done very well. One of the young gentlemen has had occasional outbreak of malaria. There has been no sign of an outbreak among the others since the boiling began.

Dr. O. McMullan said that he had read Dr. Lewis' pamphlet. His experience ran back some twelve years or more in the eastern part of the country, and it went to show that malarial troubles were greatly diminished in 1884 and 1885, when there were very little. Frequently through whole years only four or five cases are heard of. The people all improved when the open wells and springs were first substituted by driven pumps; but the chills are all coming back again. In the year 1893 there was a decided change, and in the spring the people all over the country began to have chills. He thought that there must be some fallacy in the theory that the water was the cause of the chills and fever.

Dr. Sikes wished to corroborate what had just been said.

In the year 1882 nearly everybody in the hill country had chills. Then they had no more chills, except a few up and down the border of a swamp, until 1894. They did not have any pumps nor make any change, drinking the same water and exposed to the same causes all the time. Chills come in his country by epidemics.

Dr. Duffy did not wish to detract anything from the importance of a good supply of drinking water, but he did wish to say something in favor of bad air as a possible cause. He related the history of a set of cases that fell under his observation last year. At a place five miles from Newbern, known as Fay's Mill, the pond had become dry, and had been so for several years. A stream of water ran through the bed. A family lived there on the verge of that mill-pond and drank from a spring that ran from a rock. That was the only water they used, and the most malignant case of malarial fever that he saw during that year was in that family. One patient was totally unconscious from having convulsions. Fortunately, he had a supply of Sharp & Dohme's bimuriate of quinine for hypodermic injection, and he recovered. There were a number of cases in that family. While he did not think that the importance of good wells could be exaggerated, still he thought that an eye ought to be kept on bad air also.

Dr. Lewis said that those who had read his pamphlet would bear in mind that he did not commit himself entirely to the water theory, but at the same time it was written from the point of view of an advocate, and that he had deliberately overlooked, so far as he could, any evidence on the other side. He did it because if the people were given any avenue of escape they would take it, and he left out a good deal of evidence on purpose.

He was surprised to note that the word cistern had been left entirely out of the discussion. He was a stronger advocate of the cistern than of the driven well, but failing the cistern he advocated the driven well.

Dr. Lewis was asked if he thought the malarial germ could go seventy-five or eighty feet below the surface.

He said he believed it not impossible for the germ to go down the side of the pipe.

Dr. Pate said that there are other things about the well beside malarial poison. The old bucket and the old sweep system are very frequently the cause of the infection of the water by typhoid fever and other germs. It was almost impossible to get a washerwoman who could not go and wash the poison from her hands into the well by handling the chain or pole after they had been infected by the soiled clothes. He was sure that he had seen cases of typhoid fever arising from that source, and he recommended the bored well to prevent that infection as well as others.

Dr. Haigh asked about the reports of health from the different counties. The death-rates of several small places had been so high that they attracted his attention, and he asked if there was any special cause.

Dr. Lewis, in answering, read the reports and explained that the death-rates, appearing monthly in the *Bulletin* were merely temporary. Many of the returns were worthless on account of the town authorities not taking proper care to render the reports accurate. In one town there are some 3,500 negroes, and months and months will pass without a single death of a negro reported. That is because the regulations in regard to statistics of deaths are not carried out. The only way to make the statistics accurate is not to allow a dead body to be removed until a death certificate has been signed by a physician or a magistrate. A report under 12 per thousand he considered worthless.

The President did not consider the statistics as worth anything, but could see no way at present to enforce the laws. Many valuable points could be brought out and very simple certificate. It ought to cover not only the age and race, but the place of birth and how long the person had resided in the place of his death. It would affect the sanitary history of a town very materially. A person coming to a town and dying in a month of something contracted before, affects the death-rate of a town and its sanitary history very injuriously.

That brings up another very important subject—that of acclimatization of foreigners. In looking over the deaths from yellow fever he had noticed that Germans died more rapidly than any others. A great many people died of so-called bilious fever of the type in Wood's Practice. Dr. Guiteras, in studying the nature of the fevers of the South, believed some of these were cases of yellow fever unrecognized, and he says that a large portion of the proof is based upon the fact that newly arrived emigrants died of it.

The Conjoint Session then adjourned.

GEO. GILLETT THOMAS, M. D., *President.*

RICHARD H. LEWIS, M. D., *Secretary.*

CONJOINT SESSION AT WINSTON, MAY 63, 1896.

The Conjoint Session was called to order by Dr. Geo. Gillett Thomas, President of the Board of Health.

At the first order of business the session listened to the following address of the President:

The cause of preventive medicine, which we represent, is receiving everywhere the increasing support of the laity and the law-makers; and it behooves us, therefore, to carefully consider all the problems that the session may present to us.

Men of thought and genuine public spirit, men who are not politicians from any selfish motive save the laudable ambition of helping and being accounted as promoting all measures that will bring the greatest good to the greatest number. Men of scientific attainments, not the mere scholar and student, but men possessed of knowledge that they can and do turn to a practical use, all men of great worth and close observation are flocking to the aid of the sanitarians.

In proof of this the meeting of the American Public Health Association is largely composed of laymen, but they are just as much interested and in earnest as the professional men, and the quota of the work which these lay members furnish is just as important and impressive as that sent in by the members of our medical profession. We feel, therefore, that we ought to seriously ask ourselves if we each and every one are doing all in our power to aid in the work of the Board of Health of this State.

During the year just ended, your Board of Health has been less conspicuously employed than in former years, but they have been none the less active. Under the skillful guidance of their most efficient Secretary, Dr. R. H. Lewis, the work has become more and more systematized, and the only flaws of importance in the laws at the present are the want of more mandatory powers, and more money to effect the execution of the orders of the Board.

The health meeting at Washington, one of the missionary sanitary conventions, of the purpose and scope of which you were apprised last year, was a marked success, and is bearing legitimate fruit right now. These meetings will be repeated just as often as possible. It must be remembered that the personnel of the Board is composed of active practitioners and laymen who are always intensely engaged. Due consideration for the life work of these men must be had always in projecting and carrying into effect one of these meetings. There is no doubt that the examination of drinking water here and there all over the State, examinations made to clear up the history of outbreaks of disease, has opened the eyes of the people to the necessity of more care in the provision of the water they use. Coupled with this is the work of Dr. Lewis in the study of the connection of malaria with drinking water. It is quite impossible to measure the extent of good that is the outcome of his earnest labors in this field. I know of a certainty that it has impressed people who have never heard of or read his excellent monograph, but have come into possession of the facts which he so admirably set forth. Those of you who saw the exhaustive report of Dr. Pate on the sample of water sent to him from Wilmington, and the clear connection that his examination established between the drinking water used at a gathering of young people and certain cases of typhoid fever occurring among them, will realize of how much importance this new departure of the Board of Health is worth.

I believe that it is a fact that typhoid fever, that deadly scourge, is a preventable disease, and that gradually it will be so environed by preventive measures that it will be stamped out. This hope and belief is no doubt to be realized in a future more or less distant, but it is a well founded hope never the less. Tuberculosis, the great rival of enteric fever, will also be controlled, and materially lessened, or be made to vanish, as the laws for its control are gradually evolved from the study and efforts of the sanitarians. These are not vain hopes or utopian dreams. Cholera has been controlled, yellow fever has been stopped at the border, small pox is isolated and checked by vaççination, and these are the work of health authorities.

There is a subject worthy of your serious consideration both as citizens and physicians. There are, as many, I might say all, of you know, a large class of insane people who are classed as incurable, and on account of their mental troubles they are in some of the counties gathering in the alms house—in others confined in jails, and in all of the counties a large number of them go about at large, constituting a menace to the communities in which they live, as well as often imposing a burden upon the household that is really unable to care for them. It is safe to say that no insane person, no matter what the character of the mental abberation may be, is other than a dangerous person and liable to do damage at an unlooked for moment; or in the case of females become the prey of brutal men. This subject was presented to you in Raleigh at the joint session of 1893 by Dr. Hodges, and it is opportune now to revive it. He did not suggest any plan for the relief of these dements that was seized upon. It seems now that something ought to be done, and to elicit discussion and an exchange of opinion, I propose that you consider the propriety of asking the Legislature to provide district asylums for these people. The general asylums are not large enough to accommodate them, nor is there any provision for them in the financial budget of the State. As you meet them in your rides through the city streets or along the county roads, or see them in homes, where they are unwelcome inmates, you often wonder why some sort of law is not enacted, providing for the isolation and care of the poor helpless creatures.

At present, as I have said,they are cared for in some places better than others by the County Commissioners and are pensioners upon the tax-payers. It seems that these dements could be gathered together in groups, as for instance all of the counties in a congressional district sending their pauper insane, who cannot be admitted to the general hospitals at Raleigh, Morganton or Goldsboro, to a hospital to be established at some central point in the district and maintained by the counties comprising this district. If too many counties were in any of these districts other divisions of fewer counties might be made. Provisions for the control and care of these hospitals and the inmates could be made by a general board of control under the guidance of the Commissioners of Charities, assessments to be laid on each county according to the number of inmates sent. This plan would increase the salaried officers of the State and unfortunately would necessitate more political appointments.

This plan or some other should be adopted for the care of these unfortunates, and this would naturally lead up to the establishment of schools for feeble minded children, enabling them to be taught to be of some service to themselves and to the State. This neglect of these stricken people has been too long allowed, and their wrongs and needs cry aloud for redress. We hope to have the matter seriously considered and to present it again until some action is taken.

There is another subject that needs legislation.

The health resorts of the State are growing in number and importance. Those that have risen to the rank and dignity of towns are under some sort of medical and municipal control. But the large majority of these places provide only for summer visitors, and are under no regularly instituted supervision in matters of hygiene. The consequence is that sickness of more or less serious nature is the first thing that arouses these people, the hotel and boarding house keepers, to the necessity for any care for their sanitary surroundings. It would seem, therefore, that any of these resorts where large numbers of our people congregete during the hot months of the year, if there is no responsible health officer to direct matters, that the Board of Health of the State should have the power to interfere in behalf of both the householders and visitors and establish rules and regulations for their safety, with the power also to inflict penalties for violations or neglect.

Let me thank you for your interest in the work which, as your delegated authority, we have been doing and bespeak a continued and increasing interest in the labors of the Board of Health.

Dr. O'Hagan said:—I am sorry to say that in many instances the position of Health Officer in many counties is eagerly sought for and competed for by medical men who have not the honor of the profession at heart nor who duly appreciate its dignity. It has degenerated down into a little miserable petty office which has not been properly remunerated. The suggestion made by Dr. Thomas as to the sanitary control of mineral springs and health resorts is, I think, very timely. I beg to suggest to his consideration and that of the Board that there should be some legislation giving them power to exercise jurisdiction over large boarding schools throughout the State which, I think, in at least one instance that I know of, totally disregarded all sanitary laws. There has been a lamentable neglect of control of these institutions as to proper feeding, sanitation of building and the surroundings, proper lighting, ventilation, etc. In some I know the pupils have not been properly fed. I know one instance where the water which was used for ice was taken from a pond which was largely contaminated by poultry and other living animals, and large portions of filth, etc., had been piled up during the winter season for the use of the pupils the following season. Sanitation was grossly neglected. Then the lighting of the study rooms was insufficient and unhealthful, and the result was a great prevalence of eye diseases. Whether the present sanitary legislation of the State empowers the Board of Health to pay regular visits I am not aware, but if it does not give power to control these matters to some extent, it certainly ought. As to the care of the insane, I appeal to the members of the Society to interfere in some way or other for the relief of these unfortunates. But even supposing that there was any efficient legislation, I think that there should be an entire change in the methods of providing for the care and sustenance of the unfortunates. We have been spending large sums of money in completing buildings, and if this money were properly distributed it would enable us to take care of twice that number in a more efficient manner. I make these suggestions, that there should be some means by which sanitary visits should be paid to public schools, that it should be made the duty of the superintendents of education (who are generally unfit for the position) that they should insist that the light, ventilation and drinking water should be the best that can be had. In many instances I know the drinking water is not good. I know that the light and ventilation is totally insufficient and prejudicial to study and health. I think that instead of having great central hospitals like those of Goldsboro and the Raleigh Insane Asylum, which would involve an enormous expenditure of money, they should be done away with and a building of more humble degree should be erected in each Congressional district, and the expenses would come immediately out of the pockets of the people of that Congressional district, and the one who has charge of this building would be held strictly accountable for the condition of it, and would be directly under the eye of the friends and relatives of the unfortunate inmates.

Dr. Murphy agreed with the President that no insane person could be considered as safe—they are liable to become dangerous at any moment. He explained the condition of the buildings at Morganton, and while the cost per bed at the present time was above $200 probably, this included the original cost of the grounds and executive buildings. He had mapped out plans whereby additional quarters could be supplied, on the colonization plan, at considerably less than $100 per bed. He thought it would be more economical and more beneficial to provide room at the existing asylums than previde many separate institutions.

The Secretary, Dr. R. H. Lewis, read his annual report.

REPORT OF THE SECRETARY OF THE NORTH CAROLINA BOARD OF HEALTH FOR THE YEARS 1895-'96.

The past year has been, I am happy to say, an uneventful one in sanitary matters. No epidemics of disease have occurred, and small-pox, which has prevailed, more or less, over the whole country, has passed us by entirely. Fortunate, indeed, is it that we have escaped such a visitation, for immense numbers of our people remain unvaccinated, and your Secretary frankly admits that he cannot devise any method of materially reducing the number. The only thing that seems to have any effect whatever is the actual or supposed presence of the disease in a community, and whenever a scare is heard of the Superintendent of Health is urged to utilize it to the fullest extent and vaccinate as many as possible.

But while our work has been chiefly routine, I believe it has been the most effective in the history of the Board. It has consisted, in large part, in continuing the distribution (already inaugurated at our last meeting) throughout the state, in various ways, of the health pamphlets with which you are familiar.

In compliance with your instructions, I added to the pamphlets published up to that time the excellent paper read before the Salisbury Health Conference by Dr. A. R. Wilson, of Greensboro, on "The Importance of Disinfecting the Bowel Discharges in Typhoid Fever," supplementing it with the section of the law bearing on that disease, and a short account of the famous Plymouth epidemic. Acting upon the authority given me at our last annual meeting, I had printed 20,000 copies each of these articles: "Prevention of Tuberculosis," "Drinking Water in Its Relation to Malarial Diseases," and "Instructions for

Quarantine and Disinfection," and have distributed nearly all of them. They have been sent to all the newspapers in the State, all the physicians, all the lawyers, nearly all the ministers, white and black, public officials, State, county and municipal, the more prominent teachers, and to numerous individuals whose names were sent to me in response to the circular letter enclosed in every package, asking the reader to send me the name and address of every one he thought would read them. As the Board has very wisely, in my humble opinion, in our present stage of sanitary development, determined to direct its efforts mainly to interesting and educating the people in the principles of preventive medicine and impressing upon them the advantages to be derived from a strict observance of the laws of health; and, as large numbers of our public school teachers, farmers and merchants have not yet seen them, I would respectfully suggest the advisability of printing another edition of at least 20,000 more.

It would be well to supplement the publications named above with the excellent papers on "Impurities in Drinking water" and "Sanitary Drainage and Disposal of Household Wastes," read at the Washington Health Conference by Dr. F. P. Venable and Mr. J. C. Chase, respectively, and perhaps also with the article on "The Care of the Eyes and Ears," as it was stereotyped by my lamented predecessor and the cost of paper and press-work would not be great. Since it is desirable that instruction should be given in all the subjects treated, and as our plan has been to send a complete set to every one, even if he asked for only one, it would be less expensive and more satisfactory in every way to have them all bound together. We can doubtless have the literature intended for the teachers of the public schools distributed by the Superintendent of Public Instruction without cost to the Board, which would mean a very considerable saving in postage.

In this connection you will be interested to know that in September last I received a letter from the Rev. Phillips Verner, of South Carolina, a worthy grandson of the late Charles Phillips, D. D., for so many years the distinguished Professor of Mathematics in our University, who expected to go shortly as a missionary of the Presbyterian Church to the Kassai river country, in the Congo Free State, asking for the publications of our Board on the subject of malaria, and promising to send us the result of his observations and experience in that pestilential valley. If it should turn out that the saving of the life of even one of the noble men who have taken their lives in their hands for God and humanity is accomplished, we might well feel that our labors have not been in vain.

Whether it is attributable directly or indirectly to our stirring of the waters, it is none the less a gratifying fact that a Social Science Club established at Trinity College has taken up the subject of sanitation. The request of its Secretary for any literature we might have was, it goes without saying, gladly honored to the fullest extent of our ability, and our satisfaction was still further deepened by reading in the papers an excellent article on the general subject by Professor Dowd, the President of the Club. It is to be hoped that all our institutions will, as years go by, while not relaxing their efforts for the development of the "*mens sana*," lay more and more stress on the "*corpore sano*," not only by a judicious encouragement of athletics, but by giving instruction as to the means of preventing those ills to which all flesh is heir and before which the strongest athlete, when once in their clutches, is liable to be "downed" forever.

HEALTH CONFERENCE AT WASHINGTON.

On November 6th the Second Health Conference with the people was held at Washington. Like the first at Salisbury, in September, 1894, it was quite a success. A number of papers were read and discussed. One of these, on "Preventive Medicine," by Dr. J. C. Rodman, was published in the NORTH CAROLINA MEDICAL JOURNAL, and the others, with the exception of Mr. Chase's, on "Sanitary Drainage and Disposal of Household Wastes," have already appeared in the *Bulletin*. This last will be printed in our next issue. The profession of the town and vicinity and the citizens evinced much interest, as was shown by the fact that the hall was filled literally to overflowing, many being turned away for want of room—an occurrence most gratifying and unexpected, for, as we were constrained to say in a notice of the meeting in the *Bulletin* for November: "We never expected to live to see the day when people in North Carolina would be turned away from a health meeting for want of room." Those present still further showed the sincerity of their interest by the questions they asked. While the influence of these meetings does not visibly extend beyond the immediate community where they are held, they do undoubtedly, from assurances to that effect we have received, make a decided impression within those limits. And if we can bring our larger towns to a realization of the importance of sound sanitary laws well administered, we shall surely accomplish great good. In order to extend more rapidly this form of work, it might, perhaps, be well to supplement the conference of the whole Board with the people of the larger cities and towns by having small committees from the Board hold what might be properly called Health Institutes in the smaller places.

NATIONAL CONTROL OF SANITARY MATTERS.

The following correspondence on this subject between His Excellency Governor Carr and your Secretary explains itself. It should, however, be stated that an expression of opinion from the Board, in its corporate capacity being impossible, the views given are merely those of the writer:

STATE OF NORTH CAROLINA, EXECUTIVE DEPARTMENT,
RALEIGH, January 11, 1896.

Dr. Richard H. Lewis, Secretary North Carolina Board of Health, Raleigh, N. C.

DEAR SIR:—I am instructed by the Governor to enclose you a letter from Joseph F. Edwards, asking for brief expressions on the advisability of a National Code of Sanitary Laws, etc. The Governor would be glad if you will give him your views in regard to this matter.

I have the honor to be, yours very truly,
S. F. TELFAIR,
Private Secretary.

NORTH CAROLINA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, 217 N. Wilmington St.,
RALEIGH, N. C., January 14, 1896.

His Excellency Governor Carr.

DEAR SIR:—In replying to your communication enclosing a circular letter from Mr. J. F. Edwards, editor of *The Annals of Hygiene*, and requesting an expression of my views upon the question, "Should we have a comprehensive State or National Code of Sanitary Laws, designed to promote the health of the people, the observance of which should be made compulsory and their infringement made punishable, or should we be satisfied with efforts to educate the people up to the importance of a voluntary observance of sanitary laws? Should we compel or coax obedience to the laws of health propounded therein?" I beg to say:

The State can have no higher duty than the protection of the life and health of its citizens, and it should, therefore, exert all its powers to promote that end, so that in my opinion it should employ both compulsion and education—the latter always and everywhere, and the former whenever practicable. In a city with a well-organized and equipped health bureau, with a strong police force to back it up, sanitary laws might be fairly enforced in the face of an adverse public opinion (until the next election), but in a sparsely settled rural community, like our State, for the most part, any law unsupported by public opinion would be a dead letter. At the same time the very existence of such laws upon the statute books would have an educational influence, and attempts to enforce them would stir up the people, excite interest in, and discussion of, the subject, and open their minds to the importance of, and need for, such laws. The few that we now have relating to contagious diseases, the contamination of water supplies, etc., have undoubtedly advanced the cause of the public health, although I have never known of a single person being punished for the violation of one of them. This is especially true of our cities and towns.

Our own State Board of Health, having only advisory powers, has devoted itself to the education of the people by the distribution of literature of a practical character, and by holding "health conferences with the people," and I am gratified at the assurance from various quarters that we have made a distinct and favorable impression upon the public mind.

I am opposed, personally and officially, to the interference of the General Government in our local affairs, sanitary or otherwise, except upon request, in times of emergency beyond our power to meet.

With great respect, I am, very truly, yours,

RICHARD H. LEWIS, M. D.,
Secretary.

VITAL STATISTICS.

Realizing that vital statistics, unless accurate, are practically worthless, and being convinced from the figures that the reports sent in from some of our towns were given incomplete, I made an effort to secure greater accuracy by sending the following circular letter to all the health officers making reports:

NORTH CAROLINA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, 217 N. Wilmington St.,
RALEIGH, N. C., November 1, 1895.

DEAR SIR:—Vital statistics, to be of any value, must be accurate. The only vital statistics obtainable in our State are the mortuary reports from the cities and towns. Some of these reports bear upon their face evidence of inaccuracy—incompleteness. It is not just to the towns making full reports and giving the real death-rate that they should be placed in the same category with those which do not. I therefore propose, beginning with the December reports, to print in bold-faced type those reports which are vouched for by the officials making them, and to call attention to that fact in a foot-note, so that any one examining the tables may know which are reliable. If you wish your reports to go into the higher class do not fail every month to have their accuracy vouched for by the proper official over his own signature.

I would respectfully call your attention to the fact that reliable mortuary statistics are unattainable in the cities and larger towns otherwise than by a rigid enforcement of an ordinance forbidding, under penalty, the burial or removal of a dead body without an official permit based upon a duly executed death certificate. I enclose model ordinance and sample blanks, that they may be of assistance.

Your cordial co-operation in this matter is earnestly desired.

Very truly yours,
RICHARD H. LEWIS, M. D.,
Secretary.

The certificate printed at the bottom of every mortuary blank that the health officer was required to sign to secure the placing of his town in the list of those regarded as making reliable reports, was this: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." Notwithstanding this there are still three or four towns which, for one reason or another, have not complied with this requirement, and have in consequence to be enrolled in the second class. It is to be hoped that this will be remedied. Owing to the fact that we are so largely a rural population our only opportunity to obtain vital statistics is afforded by our towns, and in these days of scientific accuracy mere assertions as to the healthfulness of our State do not satisfy the intelligent inquirer.

COUNTY BOARDS OF HEALTH.

It is with much regret that I am compelled to report a discouraging amount of indifference in a good many localities on this subject on the part of the members of the profession. In a number of counties at the regular biennial meeting, on the first Monday of September last, a legal quorum could not be obtained. And this, too, in spite of a circular letter sent with the notice of the meeting (required of me by the law) to every registered physician in the State, calling attention to the decision of the Attorney General to the effect that no action on the part of the boards would be valid unless a majority of all those eligible to membership participated, and urging upon the readers the importance of selecting their own superintendent of health, and not allowing the privilege to lapse into the hands of the county commissioners. While in many instances the commissioners elected superintendents, in at least one instance that has come to my knowledge they took advantage of the opportunity to give the place to the lowest bidder, thereby reducing the salary, that had been $250, to $50, and in others they went still further, and refused to elect any superintendent at all. As a consequence of this the number of counties having superintendents of health has been reduced from 90 to 86. At one time there were 91 counties having superintendents, but in Graham, before the last election, the superintendent left the county and no successor has ever been elected. Camden, Currituck, Hyde, Pamlico and Washington have never organized county boards, notwithstanding repeated efforts on my part to accomplish it. The chairman of the board of commissioners of Pamlico, who was the only one replying, stated that they could not find a physician who would accept the office. Why he did not say, but probably because of the small pay offered in that small county. Since September 1, 1895, for different causes the county superintendent of health has been discontinued in Chatham, Gates, Henderson and Jones. This retrogression, as a fact, is discouraging, but the mental or moral attitude of the authorities towards sanitation and the proper care of the poor and of the prisoners is yet more so. There is only one way to remedy this condition of things, and that is by educating public opinion. As mentioned above, the Board is trying to do this itself, as far as the means at its disposal will allow. But no influence can be brought to bear comparable to that of the family physician. If the members of the profession would cordially co-operate with the Board and show to their patients an active interest in hygiene and impress upon them the value and importance of its laws, great things could be accomplished. Can we not obtain that help? Are not our medical men, admittedly among the best educated in the country, sufficiently enlightened and humane to lend their interested aid to so grand a cause as the wholesale saving of life? We can but believe that the cause of this indifference on the part of so many—not all, by any means—is simply thoughtlessness—they have never considered the question seriously. We sincerely hope for better things from them. While these discouragements and others press upon us there is no question that the public mind has been appreciably awakened, and that the people of the State, as a whole, are much more interested in, and alive to the importance of, preventive medicine than they were twelve months ago. We have not been standing still.

On motion the conjoint session adjourned.

GEORGE GILLETT THOMAS, M. D.,
President.

RICHARD H. LEWIS, M. D.,
Secretary.

REPORT ON THE SANITARY CONDITION OF THE STATE AND OTHER INSTITUTIONS.

Owing to the exhaustion of the appropriation made by the General Assembly for the work of the Board, the usual inspection of the convict camps could not be made. All the State institutions proper were, however, visited and inspected, as appears from the particular reports below:

NORTH CAROLINA INSANE ASYLUM, INSTITUTION FOR THE DEAF, DUMB AND THE BLIND, PENITENTIARY, STATE CAPITOL.

Dr. George G. Thomas, President of the State Board of Health.

SIR:—The Committee of the Board of Health appointed to make a sanitary inspection of the North Carolina Insane Asylum, the Institution for the Deaf, Dumb and the Blind, the Penitentiary and the State Capitol, begs leave to submit the following report:

NORTH CAROLINA INSANE ASYLUM.

Your Committee was received with every courtesy by Dr. Faison in the absence of the Superintendent, and was shown through every ward in the Asylum. The wards upon the male side were too much crowded, but the additional wing in process of erection will relieve the present wards of this undue strain. The sanitary condition of these wards was otherwise good. The cleanliness, neatness and good ventilation were worthy of note. The water closets flushed well and seemed to be well trapped. Very little odor was noticeable from them. The same was true of the female wards. The arrangements for feeding the patients were neat and wholesome.

The Asylum is excellently located for drainage purposes, and there is no reason why this should not be perfect. The water supply is, however, a point which should receive the careful attention of the authorities of the Asylum. The boring of a deep well which is now in progress may remedy all defects along this line. When completed the water of this well should be carefully examined and its quality determined. The stables, dairy and pig-styes were also visited and found in good condition, and so not at all a source of danger to the Asylum.

INSTITUTION FOR THE BLIND—WHITE.

Every opportunity for any inspection of the buildings was afforded your Committee through the kind attention of the Prin cipal, Mr. Ray. The ventilating arrangements for one of the large sleeping rooms for the boys seemed imperfect. It would be difficult to admit the needed fresh air, where so many were sleeping, without serious drafts, in the present arrangements. The water closet provided for the boys is poorly fitted up, dark and not well ventilated. The boarding up of some of the sinks and washstands is also objectionable. The absence of the proper storage rooms for trunks, &c., is a serious disadvantage with which the Superintendent has to labor, necessitating an overcrowding of the sleeping quarters.

The sewerage system is connected with that of the city. The water supply is also in part the city water. For food purposes the main reliance seems to be placed upon the well immediately in the rear of the building. No examination has been made of this water in the past two years, and the suggestion was made by your Committee that it be carefully examined and periodically watched in the future, as its location makes it liable to contamination at any time. There is a large cistern already constructed. This might be thoroughly cleansed and fresh water caught from the roofs and used in preference to the present supply.

INSTITUTION FOR THE DEAF, DUMB AND THE BLIND—COLORED.

The interior arrangements of this building, sleeping rooms, hospital wards, bath-rooms, closets, &c., seemed to be very good. Storage room is, however, needed, and improved furnishings for the outside closets for the boys. The large well, from which much of the water for drinking purposes is taken, is, from its depth, location and proximity to the drains, not above suspicion. It has been recently cleaned out, but its purity has not been tested in some years and should be carefully looked into.

THE PENITENTIARY.

Your committee went over the penitentiary buildings under the guidance of Capt. Fleming. Comparatively few convicts were under his charge at the time of our visit. The buildings are in good order and the health of the convicts seems to be well cared for. We think it would be wise to substitute a complete system of water closets, with good sewerage connections, for the present combination of water and earth-closets, and also to continue the exit pipe from the drain at least as far as the bed of the creek and not let it empty just outside the wall, as at present. The water used is partially derived from wells. These should be carefully watched and examined. It would seem to be safer to use the water from the large and excellent spring just below the walls.

THE STATE CAPITOL.

The plumbing and sanitary arrangements, as far as could be seen, seemed to be good. The building is connected with the city water and sewerage system. The water from the well in the Capitol Square is used by some in preference to the city water.

Respectfully,
S. WESTRAY BATTLE.
F. P. VENABLE.

STATE UNIVERSITY, COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS.

November 6, 1896.

Dr. George G. Thomas, President North Carolina Board of Health.

DEAR SIR:—Following we give a report of our visits to the public institutions assigned us by the Board.

THE STATE UNIVERSITY.

We find the general sanitary condition satisfactory. A good number of fixtures of an improved type have been provided, and the sewerage is discharged into a small branch at a proper distance from the buildings.

The water supply, which comes from a large well on the campus, appears to be falling off in quantity, and at the time of our visit the supply was so limited that no use could be made of the baths, and the urinals had very irregular flushing. For the latter fixtures a plentiful supply of water is very essential, and we consider the question of increasing the present supply a vital one.

The present shortness of supply is undoubtedly caused, in a large measure, by the use of several hundred gallons per day by the electric light engines, but be that as it may, the necessity of more water is so evident as to require no argument. An abundant supply can be had from either of two neighboring creeks at a distance of a mile or more from the present center of use.

It is probable that the present supply can be increased sufficiently to answer the purpose for awhile longer by sinking one or two more wells at a distance from the present one, but we are of the opinion that the naturally increasing use will eventually become so large that the supply could not be maintained by wells having such a comparatively small area tributary to them as the ones under consideration.

Should a supply be obtained from one of the creeks before mentioned we should consider it advisable to provide a plant that would be able to supply other consumers as well, which would materially aid in meeting the operating expenses.

We are pleased to note the installation of a well arranged electric lighting plant, which lights the grounds and buildings very efficiently. Also the opening of a "Commons" boarding hall in the gynasium building. We desire to testify to the particular cleanliness and attractiveness of everything connected with this establishment, and from personal experience can heartily commend the dietary both in quality and quantity.

THE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

The conditions at this institution are practically the same as when visited by a representative of the Board (Mr. Chase) some two years ago and set forth in his report.

The increased attendance and additional buildings erected emphasize the desirability and necessity of an improvement in the sanitary arrangements, certainly so far as convenience and comfort are concerned. In these days baths and water closets have come to be regarded as necessary adjuncts of our civilization, especially when there is any large aggregation of human beings, and we consider that in this specific instance no reasonable expense should be permitted to debar their installation.

We are aware that the question of sewage disposal has been regarded as a serious if not insuperable obstacle in the way of making a general use of sanitary fixtures. We would by no means advise the discharge of the crude sewage into the small branch that passes through the College grounds, even if there were no prospect of objections being raised by abuttors on the stream further down.

We fully believe that the limited amount of sewage to be provided for can be readily disposed of by surface irrigation on the lowest portion of the College tract, near the railroad, and that such disposal will be no more objectionable or detrimental to health than the existing privies and stables.

We do not feel ourselves called upon to go into details regarding the manner of carrying out such a work, that being the province of an engineer, and the nature and gravity of the work would necessarily require the employment of one. Suffice it to say that an object lesson can be had at the State Hospital for the Insane at Columbia, S. C., the sewage of that institution being disposed of in the way above mentioned.

If no change is made in the existing methods we believe that a better type of privy could be provided, and they could certainly be kept in better condition.

The supply of water has lately been increased by means of several driven wells, which yield a fair supply of satisfactory quality. While we are not prepared to say that there is any danger of their becoming contaminated by any pollution of the surface of the ground immediately above them, we do not consider that it is quite in accordance with sanitary teachings to make use of the ground about these wells for a cow yard. There is a certain sentiment about such matters that it is well to bear in mind, and it should not be forgotten that the youth who are educated at this institution are likely to be no small factor in assisting to raise the standard of refinement and civilization throughout the State.

Respectfully submitted,
RICHARD H. LEWIS,
JOHN C. CHASE.

THE STATE NORMAL AND INDUSTRIAL SCHOOL.

Dr. George G. Thomas, President State Board of Health, Wilmington, N. C.

DEAR SIR:—In accordance with your instructions of May 14th, we have visited the State Normal School at Greensboro and conferred with President McIver in regard to the best method of sewage disposal for that institution.

While excreta and general household wastes are occasionally disposed of by cremation in such institutions, we do not deem that method of disposal worthy of consideration in the present instance.

Water carriage is universally admitted to be the best method of removing household wastes and the method of ultimate disposal will depend upon local conditions.

In this particular instance the construction of a pipe sewer some two thousand feet in length would discharge the sewage into a small branch where the danger of its becoming a nuisance would be improbable, at least until the quantity is largely in excess of what it is likely to be in the near future.

As there seems to have been an idea prevailing that this method of disposal might contaminate the city water supply it is proper to say that such fears are unfounded, as the branch into which the sewage will be discharged joins the stream on which the city water works are located below the point where the supply is taken.

We recommend that the branches from the various buildings should be six inches in diameter and the main sewer eight inches; that the minimum grade of the former should be one foot fall in fifty feet, and of the latter one in eighty. Also that an automatic flush-tank be put in, to be operated by the waste water from the laundry, and that provision be made to turn a certain amount of roof water into the drains running from the other buildings.

The best quality of salt-glazed sewer pipe should be used. It should be laid true to line and grade, and all changes in direction, either lateral or vertical, should be made at angles eased off by slight curves, which are made accessible by manholes. By avoiding the use of long curves and having the sewer straight between the manholes any obstruction can be easily located and removed with the least possible difficulty. Additional manholes should be provided, so that the maximum distance between any two should not exceed four hundred feet.

We consider that the magnitude and importance of this work demand the services of an engineer skilled in such work. We believe that definite data to prospective bidders on the projected work will reduce the cost to an extent that will fully justify the additional outlay and at the same time the future integrity of the work will be assured.

The plans for the new infirmary were submitted for our inspection. The proposed building seems to be well adapted to the purpose for which it is designed and the only suggestion we have to offer is, that the bath tubs should be in separate rooms from the water closets.

Respectfully submitted,
JOHN C. CHASE.
W. P. BEALL, M. D.

WILMINGTON, May 20, 1896.

December 1, 1896.

THE STATE NORMAL AND INDUSTRIAL SCHOOL AND THE AGRICULTURAL AND MECHANICAL COLLEGE FOR THE COLORED RACE.

Dr. Geo. G. Thomas, President of North Carolina Board of Health.

DEAR SIR:—We have visited the State Normal School and the Agricultural and Mechanical College at Greensboro, as instructed by the Board, and submit the following report:

At the first-named institution we find the sanitary condition highly satisfactory. Since last visited by a representative of the Board a sewer has been constructed which discharges the household wastes into a small branch at a point some two thousand feet from the buildings. This sewer was laid in substantial accordance with the advice given by the Engineer of the Board on May 20, 1895, and the work appears to have been done in a first-class manner. We are pleased to learn that the advice of the Board was followed in employing an engineer to design and superintend the construction of the work. Two flush-tanks were put in as recommended, but no provision was made to provide a regular and sufficient supply of water for their operation and the present condition of the sewer shows the effect of the omission. We therefore recommend that the flush-tanks be supplied from the water works system of the institution, such supply to be so gauged that the tanks will discharge every 24 or 36 hours. We also advise that a small covered catch basin be built at the sewer outlet, designed to retain the solid portion of the sewage, which could be removed and buried from time to time. At the present time this matter is deposited along the sides of the branch and is rather unsightly, although its distance from dwellings would preclude the idea of its being a nuisance, for the present at least. We are inclined to believe, however, that the time will come when it will be found advisable to dispose of the sewage by surface irrigation and an admirable chance can be had at a short distance from the present outfall.

The water supply of the institution for general purposes comes from the city water works. At the time of our visit the supply was shut off on account of repairs to the street main so none of the fixtures could be seen in operation, but the general appearance and arrangement of the plumbing was satisfactory.

Since our last visit a well arranged infirmary has been built, ane the only adverse criticism we have to offer is that our suggestion was not followed in regard to placing the water closets and bath tubs in separate rooms. An additional isolated water closet can be very easily provided, however.

At the Agricultural and Mechanical College we find that the water supply in the kitchen comes from the city water supply, but no other fixtures are in use. The only sanitary conveniences are the ordinary box type of privies. which appear to be kept in good condition.

We consider it highly advisable that this institution should be equipped with baths and water closets, not only as a means of comfort and also conducive to health, but on account of the elevating and refining influences that will naturally result.

The sewage of the institution can be very easily disposed of by surface irrigation. The general condition of the grounds and buildings merit commendation.

By invitation of Dr. W. J. Richardson, County Superintendent of Health, we visited the jail in Greensboro. The general condition has recently been somewhat improved by the introduction of water closets, but there is no gainsaying the fact that a new jail of modern construction is imperatively needed. The present structure is a disgrace to the intelligent community which tolerates it, and the fact is so self-evident to any one who may visit it that we do not feel called upon to go into particulars.

In this connection we desire to express our conviction that there should be some restrictions against the overcrowding of jails. In some cases this is caused by using them as places of temporary detention of Federal prisoners awaiting trial, and the rapacity of the jailer for the resulting profits of boarding the prisoners appears to be the only measure of the capacity of the jail.

Respectfully submitted,

JOHN C. CHASE.
W. P. BEALL.

SCHOOL FOR THE DEAF AND DUMB.

Board of Directors, School for the Deaf and Dumb,
Morganton, N. C.

GENTLEMEN :—The undersigned, a committee appointed by the State Board of Health to make a sanitary inspection of your institution, beg leave to report as follows :

Desiring to see the institution in its everyday state, we purposely did not not notify the Superintendent of the time of our proposed visit. We are very glad to be able to state that we found it in excellent condition. We noted one or two small leaks about the water-closets. We also commented on the wooden block under a bath-tub on the girls' side resting in the channel for the waste water from the shower baths. The position of the tub should be changed, or a support of some material impervious to water substituted for the block of wood.

In a part of the basement and in the bottom of one of the ventilating shafts, we observed an accumulation of litter, which, while not positively dangerous to health, perhaps, was offensive to the sanitary sense.

We called the attention of your wide-awake Superintendent to all these matters, and he informed us that our suggestions would be promptly carried out.

We desire to make our acknowledgements to Superintendent Goodwin for his courteous attentions and for his active assistance in making the inspection.

Very respectfnlly yours,

GEORGE GILLETT THOMAS,
RICHARD H. LEWIS,
Committee.

THE STATE HOSPITAL AT MORGANTON.

To the Board of Directors of the State Hospital,

GENTLEMEN :—Under the instruction of the State Board of Health the undersigned visited and inspected the Hospital at Morganton, with special reference to its sanitary condition. It gives us great pleasure to report to the body which we represent and to yours the excellent state of affairs instituted and maintained under your direction for the well-being of the inmates. The plumbing was everywhere of the best order, and the closets were generally odorless. The only exception existed in the wards occupied by the more violent patients, and the condition in these was only noticeable by comparison with the general cleanliness that existed in every department.

The appointments of every kind in the Hospital and about the property seemed to us to deserve only the most favorable comment, unless we except the provisions for protecting the gang-wells in the rear of the barn from the washing of the buildings, which appears to us to be worthy of your attention.

We beg leave to commend the training school for nurses that has been organized by the permission of your Board. It is a most progressive measure and will redound to the good of the Hospital, and in time measurably supply the want of trained persons in the sick room, when these young persons have served their appointed time under the Hospital management.

We trust that the effort to equip a bacteriological laboratory at the Hospital will find favor with your Board. A small beginning has been made, and we submit respectfully that it will, if properly enlarged and put under trained supervision, be of great service to the institution and State at large, especially the Board of Health.

We owe to your Superintendent and his courteous and able assistants many obligations for the aid they willingly rendered us in the performance of our duty, and we esteem it a matter of congratulation that your Board has so wisely chosen the executive officers of the institution you control.

Very respectfully yours,
GEO. GILLETT THOMAS,
RICH'D H. LEWIS,
Committee.

THE EASTERN HOSPITAL AT GOLDSBORO.

To the Board of Directors of the Eastern Hospital.

GENTLEMEN:—Under the instruction of the Board of Health of North Carolina, I visited the institution which is under your care.

The courteous and capable Superintendent showed me the buildings and the property immediately around them.

The well-directed improvements of the institution were everywhere manifest, and the sanitary condition of the premises, to which I was directed to give especial attention, was excellent.

The property gave evidence of skillful management and unremitting care. The plumbing was all in good condition and the new wards you have erected were of the best modern pattern. The wards were clean and the patients were comfortably provided for and not crowded.

The scheme of the Superintendent to add to his staff a female physician of good standing will commend itself to your judgment.

I desire to tender my thanks to the Superintendent, Dr. Miller, for his pleasant attention and assistance in properly making the inspection.

Very respectfully yours,

GEO. GILLETT THOMAS.

OXFORD ORPHAN ASYLUM.

The water supply comes from some deep-seated springs on the grounds, at a distance of several hundred feet from the main building and is pumped by steam to a metal tank in the attic of the girls' building. The water is apparently of good quality and there appears to be no probable chance of contamination, as proper precautions have been taken to prevent pollution.

The girls' building is supplied with baths and water closets, and the new buildings being erected for the boys will have like conveniences. The present boys' building is not a credit to the institution, and it is gratifying to know that ere long it will be abandoned for the new buildings, which are exceedingly well adapted to the purposes for which they are designed. The plumbing in the girls' building is of a generally satisfactory character, and the same can be said of the plans of that which is proposed for the new buildings.

A new brick building to contain the kitchen and dining-rooms is nearly completed. It is admirably arranged for its prospective uses and will be a great improvement over the present arrangements. Several additional buildings and other improvements are in contemplation, and I am pleased to know that comprehensive location plans were made and lines for water and sewer pipes laid down before any of the work was undertaken. This is so at variance with the general custom in our State that it deserves mention and commendation.

The sewage is discharged through a well-laid pipe into a ditch with a never-failing stream of water several hundred feet from the buildings. I am of the opinion that in due time this method of disposal will have to be abandoned, but there is an excellent opportunity to adopt a scheme of surface irrigation, and as the Superintendent is in accord with this view and has given the matter some study, it can be safely left in his hands.

The surface drainage about the buildings will be excellent after the improvements now in progress are completed, and I see no reason why this institution should not retain its present high rank for healthfulness, which, it is believed, is not excelled in the State, taking everything into consideration.

JOHN C. CHASE.

INSTITUTIONS OTHER THAN STATE.

DAVIDSON COLLEGE.

Dr. George G. Thomas, President N. C. Board of Health.

DEAR SIR:—I submit the following report of the visit of inspection and advice made, by request, in accordance with the instructions of the Board, to

DAVIDSON COLLEGE,

for the purpose of advising in regard to the best method of sewage disposal for a new building erected for the medical department.

The general configuration of the grounds and the limited amount of sewage to be provided for indicated that it could be satisfactorily disposed of by discharging it into a small branch several hundred feet from the building.

In the course of time it would perhaps be advisable to make the point of discharge farther down the valley, or if it should seem best it could be used advantageously in surface irrigation near the point first mentioned.

The sewage of the whole institution would most likely be discharged in this direction when sanitary conveniences become available.

The question of obtaining a water supply seems to be paramount at this time and it is not at all clear from whence it can be derived.

It may not be out of place to reiterate the general instructions given in regard to the construction of the proposed sewer. The grade it would apparently have makes a six inch pipe ample for the purpose. It should be of the best quality of salt-glazed pipe and laid true to line and grade. Any change in direction, either lateral or horizontal, should be made at angles connected by slight curves. These curves should be made in manholes, and by having the sewer perfectly straight between them any obstruction can be easily located and removed. Intermediate manholes should be put in whenever necessary, in order that the maximum distance between two adjacent ones shall not exceed 300 to 350 feet. They may be used seldom, if ever, but when they are needed their absence will be found to be a serious inconvenience.

The institution is so advantageously located that it precludes any uneasiness in regard to surface drainage.

Respectfully submitted,
JOHN C. CHASE.

JOHNSTON COUNTY JAIL.

SELMA, N. C., April 17, 1886.

Geo. G. Thomas, M. D., President North Carolina Board of Health,
Wilmington, N. C.

MY DEAR SIR:—The Board of County Commissioners of Johnston county want to move their jail, and I would like for you to appoint a committee to look out for the health of the prisoners and make suggestions as to the sanitary conditions of the jail. Please notify me and I will meet the committee. Let them meet in Smithfield, Johnston county, any time between now and May 1st. Please let me hear from you at your earliest convenience.

Yours very truly,

R. J. NOBLE,
Superintendent of Health of Johnston County.

RALEIGH, April 28, 1896.

The Board of County Commissioners, Johnston County, N. C.

GENTLEMEN:—The undersigned, a committee from the State Board of Health, at the request of your Superintendent of Health, Dr. R. J. Noble, visited your county town of Smithfield on Monday, 27th inst., for the purpose of inspecting the present jail and the site on the riverside to which it is proposed to remove the same, and for giving an opinion from a sanitary point of view upon the advisability of such removal. We beg leave to respectfully report as follows:

In company with Dr. Noble and Sheriff Ellington, we carefully inspected the jail. We are much gratified to be able to say that we found it in an excellent sanitary condition—sweet and clean, in spite of the antiquated method of fecal removal by buckets still in use, and a credit to the management of those in charge. Such a desirable state of affairs under similar circumstances, we fear is not common, and we cordially commend the enterprise and humanity of your honorable Board in proposing to put in sewerage and thereby insure, as far as possible, a continuance of the same cleanliness, in that one respect at least, in spite of unfavorable changes of administration that are almost sure to come as time passes. But we think a mistake has been made in substituting mattresses on the floor for the swinging hammocks. They are unsanitary in more than one aspect, and we would respectfully suggest a return to the hammock system, notwithstanding their occasional destruction by the prisoners. The difference in cost would be trifling and they are much preferable. We also think your system of heating could be improved, and at small expense, in the manner set forth below.

The site suggested for the new jail we examined carefully, and we are satisfied that it is a much better one than that now occupied. While nearer the river, we could find no reasonable ground for thinking the danger from malaria any greater, certainly if a sufficient supply of cistern water be provided for the inmates to drink. The cost of a cistern made by utilizing a part of the walls of the basement would be trifling. While a tin-roof would answer, slate would be better and cost only $2 per square more than the best tin, proving doubtless more economical in the long run. We send you pamphlet on "Drinking Water in Its Relation to Malarial Diseases," in which you will find plans and instructions for building cisterns.

The chief advantage of the new location would be in the short sewer pipe, with rapid fall, located not very far below the surface of the ground. The long sewer, from the present location, with its gradual fall, could not be satisfactorily flushed, owing to the scanty water supply afforded by a 500 gallon tank filled by a hand-force pump, and it would eventually become clogged. To dig up a sewer so deeply buried as that would have to be to obtain the proper fall, in order to find and clear away the obstruction, would be a very expensive piece of work, and one that would almost surely recur. The short, steep sewer could be scoured from end to end daily at an outlay of a comparatively small amount of water, and should any accident happen to it in its course it could be taken up entirely and relaid, if necessary, at a very small cost.

We would respectfully deprecate the plan of merely reproducing the old jail in the new. It seems to us that it would be unworthy of a county that has the present standing and promising outlook possessed by Johnston. In our opinion you would never regret the erection of a more modern structure, in which is provided a separate room for a sick prisoner (which could be utilized also when the jail happened to be overcrowded), and quarters for the jailer—certainly for a guard—who would then always be within call so as to promptly summon aid in case of sudden illness in the night, to say nothing of the effect of such proximity upon the safety and behavior of the prisoners. It is just such little finishing touches as these which show the civilization of a community, and which not only favorably impress the stranger, but elevate the community itself.

Should a new jail be erected, we would respectfully suggest a change in the method of heating and ventilating it. We would recommend that the chimney be built with two flues, having a very thin partition between them—one for the smoke and the other, extending to the floor with a register at the bottom, for taking out the foul air. A jacketed stove with an inlet pipe passing through the wall should be provided. The fresh, pure air from outside, having been warmed as it passed through the narrow space between the stove and jacket, would rise to the top and force out through the ventilating flue the coldest and foulest air in the room, which always lies next the floor. The air in this flue, being more or less warmed through the thin partition by the hot smoke, would rise and, therefore, draw, making a *pull* upon the foul air in addition to the *push* given it by the warm, fresh air constantly pouring in. The adoption of this method would furnish ideal heating and ventilation at a merely nominal cost.

Expressing our appreciation of the courtesies shown us, we are

Very respectfully yours,

GEO. GILLETT THOMAS,
RICH'D H. LEWIS,
Committee.

MUNICIPAL WATER SUPPLIES.

At the annual meeting of the Board at Winston the subject of the municipal water supplies of the State was discussed. While the Board realized its inability to accomplish much in the way of assuring the purity of such waters owing to the total lack of mandatory powers in the law covering it and the insufficiency of the appropriation to justify more than the most cursory investigation, it feels that something should be done. It was therefore decided, as appears in the report of the proceedings of the meeting printed above, to have a single examination made of each public water supply, that being as much as it could hope to pay for. This was done for the purpose of informing the water companies that some one was overlooking them, and with the intention, if a supply should be found bad and the company refused after having its attention called to the fact to make at least a reasonable effort to remedy the trouble, to bring the pressure of public opinion to bear upon it by having the results of the investigation, setting forth the character of the water, published in the local newspapers.

In compliance with the order of the Board the Secretary mailed to the respective health officers of the cities and towns having public water supplies, viz: Asheville, Charlotte, Concord, Durham, Fayetteville, Goldsboro, Greensboro, Henderson, Newbern, Raleigh, Salem, Salisbury, Wilmington, Wilson, and Winston, the following letter:

NORTH CAROLINA BOARD OF HEALTH,
RALEIGH, N. C., August 15, 1896.

MY DEAR DOCTOR:—The Board has ordered, for its own information, a bacteriological examination made of the public water supplies of all our cities having them. It wishes the sample taken by a medical health officer from a faucet from which drinking water is drawn, and packed and shipped in exact accordance with the directions on the back of the permit herewith enclosed. Accompanying this will be a sterilized bottle.

Please do not fail to take the sample, and pack *immediately* with an abundance of ice and sawdust, as near the departure of the train as possible so as to lose no time in transit.

As the Board proposes to bear all the expense you will not prepay express charges. You can also send bill to me for cost of packing. Your prompt and careful attention to this matter would oblige. Yours very truly,

RICH'D H. LEWIS, *Secretary.*

Upon the receipt of the report from the bacteriologists, this letter was mailed to the health officers of the cities having infected water:

NORTH CAROLINA BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
RALEIGH, N. C., October 6, 1896.

DEAR DOCTOR:—I learn from the duplicate report sent me by Dr. (Anderson or Pate, as the case was) of the bacteriological examination recently made by him, at the request of the Board, of the public water supply of your city, that the water is infected with intestinal bacilli. It is, of course, unnecessary for me to call your attention to the danger to the people of your community of an infection of their water supply of such a character, or to the importance of immediate action on your part in the premises. I would thank you to let me know at once what steps you have taken in the matter, and also what action those in control of your water supply propose to take. As the Board is to meet at Charlotte on the 15th inst., a reply before Wednesday, the 14th, when I must leave for the meeting, would be greatly appreciated.

Very truly yours,
RICH'D H. LEWIS, M. D., *Secretary.*

To this letter only one reply, from Raleigh, was received.

At the meeting of the Board during the Health Conference with the people in Charlotte on October 15th, two months after this letter was mailed, the Secretary stated that he had received from the bacteriologists employed by the Board, Drs. Albert Anderson, of Wilson, and W. T. Pate, of Gibson Station, reports on all the supplies except those of Charlotte and Fayetteville, from which he had up to that time been unable to obtain satisfactory samples. From the reports received (which see below) the waters of Asheville, Concord, Greensboro, Henderson and Raleigh were shown to be infected with intestinal bacilli, and those of Goldsboro, Newbern and Winston suspicious, while the remainder were more or less good.

As the result of this showing the Secretary, as appears in the proceedings of the Board, "was instructed to have made immediately another bacteriological and a chemical examination of all the infected and suspicious waters; and he was further ordered in those cases where the water was shown to be still bad to notify the Superintendent of Health, the Mayor and the manager of the water works of the fact and call upon them in the interest of the public health to remedy the trouble, and, if he did not receive satisfactory assurances within thirty days that this had been done, to have the analysis published in the local papers for the information of the people using said waters.

In obedience to these instructions the following letter was sent to the health officers of the cities having water infected with intestinal bacilli (except Henderson, the report on its water not having been received, at that time) and a special letter in each case to those whose water was reported as being suspicious, which will be found in the particular report on those supplies given further on.

NORTH CAROLINA BOARD OF HEALTH.

RALEIGH, October 28, 1896.

DEAR DOCTOR:—At a meeting of the Board in Charlotte on the 15th instant I was instructed to have made a second bacteriological as well as a chemical analysis of those water supplies that were reported by the bacteriologists of the Board to be infected with intestinal bacilli or suspicious. As the water of your town comes within that category I send you herewith permits for both analyses and a *sterilized bottle for the sample intended for the bacteriologist.* Be sure not to get the bottles mixed. You will kindly draw the samples from a faucet from which drinking water is taken, *in strict accordance with the directions printed on the back of each permit*, otherwise the analysis would be vitiated and worthless, and ship at once by express at our expense. The sterilized bottle for the bacteriologist should be packed in plenty of ice and sawdust to prevent the increase in the number of bacteria which would surely occur unless the water is kept cold until it reaches him.

Your *prompt* and *careful* attention would oblige.

Yours very truly,

RICHARD H. LEWIS, M. D.

Secretary.

In response to this letter, while all of the eight cities and towns having infected or suspicious water sent samples for the second bacteriological examination, only Goldsboro and Henderson complied with the request to send samples also for chemical analysis.

The question of public water supplies for most of our cities and towns in North Carolina is not an easy one. With some exceptions they must in the nature of things get their water from small, short streams, which are fed from cultivated and more or less thickly populated water-sheds. This renders them peculiarly liable to dangerous infection, and extra care and supervision of them is demanded in the interest of the public health. It is so serious a matter that it should not be left to the water companies themselves, most of which are private corporations whose principal stockholders are often non-residents, chiefly interested in dividends. But even where the works are owned by the city itself the management cannot be counted on as the best always, owing to the influence of political considerations. Legislation giving the State Board of Health, a disinterested body whose only concern is the protection of the health of the people, control of all public water supplies with mandatory powers is urgently called for. What could be accomplished by the Board in this respect, if clad with sufficient authority, can be imagined from the results given below by its work in this direction, imperfect as it is from lack of money and of power. The people have a right to demand that their lawmakers should provide the means for assuring them pure water.

In reading the reports below the correspondence given above should be born in mind.

ASHEVILLE.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., September 28, 1896.

Dr. E. C. Starnes,
Superintendent of Health, Asheville, N. C.

DEAR DR :—A quantitative bacteriological examination of the sample of water sent me by you from the public water supply in your city shows 5,000 bacteria colonies to the cubic centimetre. Any water containing over 400 colonies to the cubic centimetre should be regarded with suspicion. The sample sent by you showed up an abnormally large number of bacteria, which was partly due to the ice melting some time before sample arrived. In culture media containing glucose, intestinal bacteria produce fermentation with liberation of gases that collect at the top of a fermentation tube. In my tube containing glucose bouillon there was considerable evolution of gases, into which I had put three drops of your sample of water. There is an acid formed in process of fermentation by these bacteria. In the medium of lactose-litmus-agar—a blue medium—a culture of your water showed red colonies from the effect of the acid produced by intestinal bacteria. Litmus milk was converted into a pink color and plain milk was coagulated—additional proofs of the presence of intestinal bacilli.

Judging your city water from this sample, I consider it bad and unfit for drinking purposes.

Respectfully submitted,
Duplicate. ALBERT ANDERSON.

WILSON, N. C., November 30, 1892.
Dr. E. C. Starnes,
Superintendent of Health, Asheville, N. C.

DEAR DOCTOR:—I submit the following report of the bacteriological analysis of the last sample of water sent me from the public water supply of your city. There were 450 colonies of bacteria to the cubic centimetre—more than there should be for good water, but I find only those of a benign form in this sample.

Respectfully submitted,
Duplicate. ALBERT ANDERSON.

CHARLOTTE.

REPORT OF BACTERIOLOGICAL EXAMINATION.

GIBSON STATION, N. C., November 3, 1896.
Charlotte Water.

DR. LEWIS:—I collected sample of water from faucet at the Buford Hotel October 16th, 4:40 a. m., and placed it in culture media the same morning at 11:30. The color of sample is a yellowish brown; muddy; deposit covered bottom of bottle after settling; no odor. The sample contains 7,500 bacteria to the cubic centimetre of water. I have isolated several motile bacilli from this water, among them proteus, but none of them show all of the cultural characters of the common colon bacilius. I think it fair to say that this water is filthy and is not safe for drinking purposes.

Yours truly,
W. T. PATE.

RALEIGH, November 10, 1896.
Superintendent Water Works, Charlotte, N. C.

DEAR SIR:—Dr. Pate, the Bacteriologist of the Board for Mecklenburg county, at the request of the Board, took a sample of your water from a faucet in the Buford House for examination. He reports the water to contain 7,500 bacteria to the cubic centimetre, and that he had isolated several motile bacilli, among them proteus, but while none of them showed all the cultural characters of the common colon bacillus, he concludes by saying: "I think it fair to say that this water is filthy, and that it is not safe for drinking purposes." It is unnecessary for me to say that this condition of affairs should be remedied *at once.* The Board does not wish to do anything to harm any legitimate business, and I therefore call your attention to the matter and give you the opportunity to apply the remedy before I call the attention of the public authorities of the city to it, as I must do under instructions from the Board unless it is promptly done. I would suggest that you have another sample drawn from a drinking water faucet (preferably one in the Buford) and packed strictly in accordance with the directions on the back of the blank which I enclose, properly certified to, and another examination made by Dr. Pate, or some other reputable bacteriologist, immediately, and send me a copy of his report. I would thank you to let me know at once what you propose to do.

Yours truly,
RICHARD H. LEWIS,
Secretary.

CHARLOTTE, N. C., November 12, 1896.

Dr. R. H. Lewis, Raleigh, N. C.

MY DEAR SIR :—Hutchison handed me your communication this morning. I was surprised at the result of Dr. Pate's analysis, as I had only a few days since received from Prof. Leeds the result of an analysis made by him. I quote from him : "Your bacteriological analysis is eminently satisfactory, the water containing no bacteria." Will you kindly let me know whether or not Dr. Pate took the water himself or who furnished it to him. Wilder, health officer here, sent him specimen according to your instruction some month or six weeks ago, but has heard nothing from him. You know our filter plant has only been in operation about six weeks, and it may be that Pate's specimen was taken from a pipe little used and that contained a lot of the unfiltered water that had stagnated in it. I can explain it on no other hypothesis. In any event I shall send, or rather have sent by health officer, another specimen to Prof. Leeds, and if you will let me know Dr. Pate's address I will also send him specimen. Shall I write to him for bottle, or will you give me directions for sterilizing bottle? The specimen sent Dr. Leeds was taken from faucet on main pipe line, but I apprehend it makes no difference where the specimen is taken from as soon as the pipes are cleaned out, and I shall have the specimen taken from main tap at the Buford Hotel. As soon as I get returns will forward them to you. If there are any other suggestions you would make, will hold myself obliged if you will do so.

Understand, I shall have nothing to do with taking these specimens, but will have that done in all due form. I am anxious to have these examinations as soon as possible, as I had thought after the analysis above alluded to that we were above criticism.

Yours truly,
R. J. BREVARD.

Raleigh, November 13, 1896.

Dr. R. J. Brevard, President Charlotte Water Co.,
Charlotte, N. C.

My Dear Doctor:—Yours of 12th instant to hand. I note with pleasure your intention to promptly make a thorough investigation into the character of your water supply, and think it would be well to have examinations made by both Drs. Leeds and Pate—as you propose. The address of the latter is Gibson Station, and you should write to him for a sterilized bottle. The reason that nothing has been heard from him by Dr. Wilder in regard to the samples sent him is that neither was taken according to instructions. After waiting a month, or longer, he sent a sample from a *well*, although he was requested to send a sample drawn from a *faucet* of the *public water supply*, and later he sent a sample in his own bottle (properly sterilized, doubtless, but we can't take any chances) drawn immediately from the filter—again not what we asked for. To be sure of having it right the Board requested Dr. Pate to take the sample himself. This he did "from faucet at the Buford Hotel October 10, 4:40 A. M., and placed it in culture media the same morning at 11:30"—to use his own words. When I saw his report of 7,500 bacteria to the cubic centimetre the explanation you suggest—that the filtered water had not gotten into that main—occurred to me.

I cannot understand Prof. Leeds' statement that the water he examined contained "no bacteria"—he must have meant no pathogenic bacteria. * * *

In fairness to your water I think it would be well to suggest to the health officer the importance of packing the sample in an *abundance* of ice and saw-dust in order to prevent the growth of the bacteria until it can reach Dr. Pate. Dr. Pate authorized me to say to the managers of water companies that he would make quantitative analysis for them for $10. I enclose blank which gives explicit directions which must be carried out to the letter, or the analysis will be invalidated. Please let me have copy of all the analyses you have made, and oblige,

Yours very truly,
RICHARD H. LEWIS, *Secretary.*

CHARLOTTE, November 19, 1896.

Dr. R. H. Lewis.

I enclose Dr. Leed's analysis. * * * *

I wrote Dr. Pate a few days since asking him to send me two bottles, as I wish to have specimens examined from the filter and also from the tap at the Buford, so that I can tell whether the trouble, should it still exist, is in the pipes. Of course I understand these are separate analyses.

Now as to examinations: I found when we took charge of the plant two, which I can't lay my hand upon, made from, I think, Johns-Hopkins, certainly some Baltimore chemist, which were entirely satisfactory. These were chemical examinations. Since that time Professor Leeds and Dr. Herbert Battle have examined it for us. Satisfactory, except about two months ago Dr. Battle found the free ammonia ran too high. This I knew was due to the cause I mentioned to you, *i. e.* that owing to excessive drouth and waste of water, the reservoirs were nearly empty, and when we did have a heavy rain we had to fill up with the rain-water which ran over the fields and meadows—was about as muddy as possible. Since then we have gotten on a large supply, and of course that cannot occur again, and if it becomes necessary while it is costly I will abandon present supply and use that from Bear Creek.

Will write you as soon as I have anything further to communicate. I feel that I am giving you a good deal of trouble and certainly appreciate your kindness.

Yours truly,

R. J. BREVARD.

I did not mention that samples have been sent by health officer.

DR. LEED'S REPORT.

STEVENS' INSTITUTE OF TECHNOLOGY,

HOBOKEN, N. J., November 17, 1896.

Sample of filtered water from Charlotte, N. C.

The sample exhibited no bacteria after three days' culture with gelatine peptone solution, and may be regarded as practically free from bacteria.

Very respectfully,

ALBERT R. LEEDS,

Professor of Chemistry, Stevens' Institute.

CHARLOTTE, N. C., November 30, 1896.

Dr. R. H. Lewis.

MY DEAR SIR:—I enclose you bacteriological examination made by Professor Wm. Royal Stokes, of the Johns Hopkins Hospital, who is also bacteriologist for the city of Baltimore, and, I believe, of the State of Maryland. You will observe that it is addressed to Professor Penniman, of the firm (if I may call it so) of Penniman & Boone, chemists. They are the State chemists, and I understand are men of very high standing. I requested them to examine it chemically and submit same to the best bacteriologist for examination. I may mention that they made the chemical examination. Don't believe you lay much stress upon chemical examinations, so will not copy it, but they made this comment: "This water shows no sign of contamination upon chemical or bacteriological examination. It is admirably suited for manufacturing and domestic purposes."

Yours truly,

R. J. BREVARD.

I shall get Pate to re-examine as soon as he sends the bottle, which he says he will do as soon as he gets a new instrument.

DR. STOKES' REPORT.

HEALTH DEPARTMENT,
CITY HALL ANNEX,
Gay Street between Lexington and Saratoga Sts.,
BALTIMORE, MD.

Prof. Penniman.

DEAR SIR:—The sample you sent me was clear, showing no sediment upon standing twenty-four hours and no odor.

Microscopic sediment: No animalculae, plants, algae. Germs: protococcus spiralis.

These minute vegetable organisms are present in pure water, and the absence of animalculae suggests this condition also.

Colonies per cubic centimeter, 146.

This is very low as compared to many of our municipal water supplies—Philadelphia often showing 15,000.

Fifty centimeters of water was examined by makers of growth in bouillon, plating, and then inoculation of fermentation tubes of glucose, lactose and saccharose, 1 per cent. bouillon.

No gas production took place after twenty-four hours, showing that the colon bacillus, bacillus coli communis, the normal inhabitant of the intestine, was not present in this amount of water.

The examination shows that the sample of water sent is pure bacteriologically; in fact, remarkably so. It is not customary to base absolute conclusions upon a single examination of an entire water supply, and a second examination would enable me to gauge more correctly of the exact condition of the water. This should be made after an interval of several weeks.

Very respectfully yours,
WM. ROYAL STOKES.

In a letter from Dr. Pate, dated December 28, 1896, he says: "I have examined two samples from the Charlotte supply, both remarkable for their bacteriological purity."

Since this investigation was made the Charlotte water works have been purchased by the city.

CONCORD.

REPORT OF BACTERIOLOGICAL EXAMINATION.

GIBSON STATION, N. C., October 12, 1896.

To Dr. Young, Concord.

The sample collected by you from the public water supply of Concord, September 25, contains 600 bacteria to the cubic centimetre of water. It contains both proteus and intestinal baccilli. In point of numbers the water is fair, but in quality of bacteria *bad.*

The indications are that if you will clean up your water shed, and stop all sources of fecal contamination, you would have fine drinking water.

Yours truly,
Duplicate. W. T. PATE.

GIBSON STATION, N. C., December 1, 1896.

Dr. Young, Concord.

The sample of water sent by you from the public water supply of Concord, November 10, contains 620 bacteria to the cubic centimetre of water. No intestinal bacilli. Proteus vulgaris present. This is better water than the sample sent September 25, but is not considered above suspicion.

Yours truly,
W. T. PATE.

DURHAM.

DURHAM, N. C., September 5, 1896.

Dr. J. M. Manning, Superintendent of Health.

DEAR SIR:—In making a quantitative examination of the sample of water collected and sent me by you on September 2, 1896, I have the honor to submit the following report: A quantitative analysis shows 128 colonies to the cubic centimetre. This number indicates that the water is good, if all the bacteria are of benign form, and I have no reason to doubt that they are, from the tests used.

Respectfully submitted,

Duplicate. ALBERT ANDERSON.

FAYETTEVILLE.

REPORT OF BACTERIOLOGICAL EXAMINATION.

GIBSON STATION, N. C., Nov. 10, 1896.

Dr. Lewis, Secretary North Carolina Board of Health,
Raleigh, N. C.

DEAR DOCTOR :—As requested by you about October 1, I visited Fayetteville October 27, and collected a sample of water from the public water supply for examination. I called at the office of Superintendent of Health twice during the day, but did not find him in. Dr. McNeill kindly took me out to the water works pond and placed me under obligation to him for many favors.

Fayetteville has the possibilities of an ideal water supply. The source is a bold sand-hill branch, rising from springs among the hills in the woods, flowing (without any surrounding swamp) over a coarse sand and gravelly bed to a short pond one and a-half miles northwest from the town. From the pond it is pumped through iron pipes to the town. The stand-pipe is on the summit of a hill ("Haymount") and gives a full pressure. The water shed proper is narrow and short, has a sandy soil, timbered with scrubby oak and a few old-field pine, and covered with trash that has drifted into heaps in many places. There are four houses on the water shed, two cabins, one farm house and the keeper's house. Stock have free access to the pond. I noticed the droppings of cattle within thirty feet of the intake.

With the expenditure of a small amount this water supply could be placed above suspicion. It would be necessary to remove the two cabins, the growth, the trash, and dyke the farm house on the pond side ; lay some drains about the keepers' house to carry surface water into branch below intake, and wire in the shed. Then by a system of terracing all water that falls on the shed could be carried into the pond sand-filtered. All of this is practicable, and, if carried out, would give Fayetteville as safe a water supply as has *any town anywhere*. I am informed that this water supply is owned by a Baltimore company.

The sample of water for examination was taken from a faucet at the Hotel LaFayette. It contains 120 bacteria to the cubic centimetre of water. It has very few fermentative bacteria. No intestinal bacilli were found. It is very fair drinking water. In fact, it is a sample of this water under the best of conditions. There had been no surface water for several days, the pond had been run low on account of a leak, and the water in the pond was mostly spring water. Much filth and many bacteria must be carried into the pond with every large rain.

Yours respectfully,
W. T. PATE.

GOLDSBORO.

REPORT OF BACTERIOLOGICAL EXAMINATION.

AUGUST 29, 1896.

Dr. W. J. Jones, Jr.,
Superintendent of Health, Goldsboro, N. C.

DEAR SIR: I have the honor to submit the following report of a quantitative bacteriological examination of the sample of water collected and sent me by you on 20th inst. The quantitive analysis shows only 100 bacteria to the cubic centimetre, and this number indicates good water, if all the bacteria are of the benign form, but other tests throw some doubt upon the bacteria being benign. I would advise that you have both a quantitative and qualitative analysis made soon. Respectfully submitted,

ALBERT ANDERSON.

Duplicate.

RALEIGH, N. C., October 6, 1896.

Dr. W. J. Jones, Jr., Superintendent of Health,
Goldsboro, N. C.

DEAR DOCTOR:—I learn from the bacteriological examination recently made of the public water supply of your city by Dr. Anderson, at the request of the Board, that there is some doubt about its safety. I would therefore beg of you to urge upon the superintendent of the water company the importance of having made immediately a thorough examination. It would manifestly be to the interest of the company, to say nothing of the health of the people. Please let me know before the 14th inst., if possible, what it is proposed to do, and oblige,

Yours very truly,
HICH'D H. LEWIS, M. D.,
Secretary.

GOLDSBORO, N. C., October 19, 1896.

Dr. R. H. Lewis, Raleigh, N. C.

DEAR SIR:—In regard to your letter concerning the public water in Goldsboro, will say that the superintendent of water company says that the filter was out of order at the time the sample for analysis was made. He says Dr. Anderson's report is very unsatisfactory, but is willing to send you a sample at any time, as he wants pure water, as his contract with the filter company calls for pure water. Awaiting your wishes, I am,

Yours very truly,
W. J. JONES, Jr.

Wilson, N. C., November 30, 1896.

Dr. W. J. Jones,
Superintendent of Health, Goldsboro, N. C.

Dear Doctor:—The following report of the bacteriological analysis of last sample of water sent me from the public water supply of your city is as follows: The number of colonies of bacteria to the cubic centimetre is 250, this number exceeding that in the previous sample 180, but all the bacteria in present sample were of the benign form.

Respectfully submitted,
ALBERT ANDERSON.

Duplicate.

GREENSBORO.

REPORT OF BACTERIOLOGICAL EXAMINATION.

Wilson, N. C., September 30, 1896.

W. J. Richardson, M. D., Superintendent of Health, Greensboro, N. C.

Dear Sir:—I have the honor to submit the following report of the bacteriological examination of sample of water which you collected and sent me on September 12, 1896, from the public water supply of your city. There were 276 colonies to the cubic centimetre obtained in a quantitative analysis, and this number of the benign form of bacteria would indicate that your city water was fair for drinking purposes. But other tests showed the sample to contain intestinal bacilli. The intestinal bacillus produces a collection of gas in a fermentation tube containing a glucose medium. In my tube filled with glucose bouillon into which I had put three drops of water of your sample, there was evolution of gases at the top of tube. This bacillus also produces an acid in process of fermentation, and the presence of this acid was shown by reddening the blue culture medium—known as lactose-litmus agar—in which a culture of this water was made. It would be advisable to remove the source of contamination at once, as the typhoid germ and the intestinal bacillus are sometimes associated.

Respectfully submitted,
ALBERT ANDERSON.

WILSON, N. C., November 30, 1896.

Dr. W. J. Richardson, Superintendent of Health, Greensboro, N. C.

DEAR DOCTOR:—I am glad to be able to submit the following report of the bacteriological analysis of the last sample of water sent me from the public water supply of your city. There were 225 colonies of bacteria to the cubic centimetre, fifty-one less than in the first sample examined, and all of the benign form.

Respectfully submitted,
ALBERT ANDERSON.

HENDERSON.

REPORT OF BACTERIOLOGICAL EXAMINATION.

GIBSON STATION, N. C., September 10, 1896.

Dr. Tucker, Henderson.

The sample of water collected by you August 20, from the public water supply of Henderson, contains 1,400 bacteria to the cubic centimetre of water. It contains intestinal bacilli.

Yours truly,
W. T. PATE.

RALEIGH, N. C., September 26, 1896.

J. H. Tucker, M. D., Superintendent of Health of Vance County,
Henderson, N. C.

MY DEAR DOCTOR:—I learn from the bacteriological examination of the public water supply of your town recently made by Dr. Pate for the Board of Health that it "contains intestinal bacilli." It would be superfluous for me to call your attention to the fact that contamination with intestinal bacilli is a form of contamination very dangerous to the public health, or to the urgent necessity for the immediate purification of your water supply and the prevention of future contamination. I would thank you to inform me as soon as possible what action the water company proposes to take and how soon.

Very truly yours,
RICH'D H. LEWIS, M. D., *Secretary.*

HENDERSON, N. C., September, 28, 1896.

Dr. R. H. Lewis, Secretary State Board of Health,
Raleigh, N. C.

DEAR DOCTOR:—Your favor of the 26th, calling my attention to the bacteriological examination of our public water supply by Dr. Pate has been duly received. Dr. Pate had written me on the result of the examination, and the matter was at once brought to the notice of the Henderson Water Supply Company, and a promise exacted from the superintendent that immediate steps would be taken to have a further examination of the water made by some competent bacteriologist *on the spot*, and, should the investigation of Dr. Pate be verified, to institute at once all necessary measures for complete purification of the supply.

I have suggested to the superintendent that correspondence with your office will, doubtless, secure the name of some competent and responsible expert who would come to Henderson and make an exhaustive study of the water and a thorough investigation of the shed and surroundings, and thus be enabled to give advice which would be acceptable to the company, your Board, and the authorities of Henderson. He has promised to write for such information.

As I wrote Dr. Pate, the good results obtained from chemical analysis by Dr. Venable and Prof. Brewer (a copy of which I send you by today's mail), and the absence of apparent sources of contamination, had caused us to feel that our water was above the average in purity, and we were quite unprepared for the announcement that it contained "intestinal bacilli." The sample examined by Dr. Pate was collected August 20th, with all possible care, and is, doubtless, a fair sample of our water in very hot and dry weather, as the pond from which the supply is obtained was on that date at its lowest mark. The water is used exclusively in our jail and in a few private families, and up to the present time we have had no case of fever, dysentery, diarrhœa, or other sickness which could be traced to its use.

I am very glad to feel that the Board of Health will give us the weight of their authority in this matter, and I will most cheerfully carry out any suggestion you may make. I will confer further with the company, and will advise you fully of any action taken.

I am,

Yours very truly,
J. H. TUCKER,
Superintendent Health Vance County.

HENDERSON, N. C., September 28, 1896.

Dr. Rich'd H. Lewis, Secretary North Carolina Board of Health,
Raleigh, N. C.

DEAR SIR :—Dr. Tucker has shown me your letter of recent date. He had also shown me the letter from Dr. Pate, some time ago, and had written him asking him if he would not make a second analysis, and we were waiting his reply. Dr. Pate now writes that he cannot do so before winter. I have written the President of our Company, who lives near New York, to engage a recognized bacteriologist to make a second analysis, and if necessary, to come to Henderson, or we will have a second analysis made at Johns Hopkins, wherever we can secure it quickest. Would you not order a second analysis for us. We take every precaution to keep the water-shed clear, and go over it every week on foot. There is no source of contamination, and when the sample used by Dr. Pate was drawn the water was very low, or at least while there was an abundant supply, yet the water in the lake was from three inches to seven feet deep, covering at least forty acres. The principal feeding was done by springs in the lake, and one very large spring which flowed down, and from which there was hardly an opportunity for intestinal deposits. I enclose you a copy of the chemical analysis made by different chemists. I notice that Section 19 of the Act establishing the Board of Health, Chap. 214, Laws of 1893, provides for consultation with your Board. What remedy do you suggest in the event that Dr. Pate's analysis should be verified? We will be pleased to execute your instructions if in power. Awaiting the favor of reply,

Very respectfully,
J. H. BRIDGERS.
Superintendent and Treasurer.

RALEIGH, N. C., September 28, 1896.

J. H. Bridgers, Esq., Superintendent Henderson Water Company,
Henderson, N. C.

DEAR SIR:—I am very much gratified to learn from yours of even date, received this P. M., that in compliance with my letter of 26th inst to Superintendent of Health Tucker, you propose to take immediately the proper steps for ascertaining the exact condition of your water. I would respectfully suggest that this Board would be glad to have all samples for analysis taken by or in the presence of its representative, Dr. Tucker. There could then be no opportunity for adverse criticism on the part of persons hostile to your company. We do not wish to do anything to hurt your business, but on the contrary to aid you in every way we can to assure the purity of the water you furnish to the public. Should further bacteriological examination confirm the intestinal infection of the water, or show any other dangerous contamination, the Board would be more than glad to advise with you as to the best method of remedying the trouble. You will oblige me by sending me copies of the analyses you have made.

Very truly yours,
RICH'D H. LEWIS, M. D.,
Secretary.

HENDERSON, N. C., October 1, 1896.

Dr. R. H. Lewis, Secretary North Carolina Board of Health,
Raleigh, N. C.

DEAR SIR :—We would be pleased to have a copy of the analysis made by Dr. Pate of our water, in order to proceed at the source of the trouble.

I hope to receive the same by the earliest mail.

Very truly,
J. H. BRIDGERS,
Superintendent and Treasurer.

RALEIGH, N. C., October 3, 1896.

Mr. J. H. Bridgers, Superintendent Water Company, Henderson, N. C.

DEAR SIR :—Yours of 1st inst. received yesterday P. M., asking for " a copy of the analysis made by Dr. Pate of our (your) water," is at hand, and I comply with pleasure. It is as follows :

" *To Dr. Tucker, Henderson.*

" The sample of water collected by you August 20th, from the water supply of Henderson, contains 1,460 bacteria to the cubic centimetre of water. It contains intestinal bacilli.

" Yours truly,
" W. T. PATE."

" Duplicate."

The Board could not afford to pay for a complete analysis of all the water supplies in the State, but its object is to ascertain if a water is dangerous, and if so to call the attention of the proper authorities to it, that they may remedy it. If I can serve you let me know.

Yours truly,
RICHARD H. LEWIS, M. D.,
Secretary.

GIBSON STATION, N. C., December 1, 1896.

Dr. Tucker, Henderson.

The sample of water sent by you from the public water supply of Henderson, November 9, contains 820 bacteria to the cubic centimetre of water. No intestinal bacilli. In point of numbers and quality of bacteria this sample is much better than the water sent August 20. I consider this sample fair drinking water.

Yours truly,
Duplicate. W. T. PATE.

HENDERSON, N. C., December 7, 1896.

Dr. R. H. Lewis, Secretary, Etc., Raleigh, N. C.

DEAR SIR:—I notice the bacteriological analysis made by Dr. Pate is much improved, and I suppose satisfactory.

I also note the chemical analysis made at the North Carolina Experiment Station seems to indicate too much free and albuminoid ammonia, though taken in connection with the low per centage of chlorine, I do not think it is a bad water. But the large amount of ammonia present is due to temporary cause, and had the sample been taken October 9th or December 9th I think there would be a very small amount of ammonia. Of the many chemical analyses this is the only one which ever raised a suspicion. I would be glad to have you order a sample drawn about the 20th of this month, and have it examined. If you intend to report this analysis to the Governor, I would be obliged not to have it go in, as it does not show the condition of our supply for about eleven months in the year. I enclose the original by Professor Venable, which you will kindly return.

Very truly yours,
J. H. BRIDGERS,
Superintendent and Treasurer.

Answered in letter to Superintendent of Health J. H. Tucker, M. D., dated December 11th.

HENDERSON, N. C., December 9, 1896.

Dr. R. H. Lewis, Secretary State Board of Health, Raleigh, N. C.

DEAR DOCTOR:—I am in receipt of the chemical analysis made by Dr. Battle, of our public water supply, and also a report from Dr. Pate, of the bacteriological examination, and have submitted both reports to our town commissioners and to the "Henderson Water Supply Company." I presume the original reports are in your office, and that you are aware of the results. You will observe that the chemical analysis gives us a suspicious, or at least a very doubtful water, while the bacteriological report shows no dangerous contamination, and classes the water as "fair drinking water." In view of the apparent difference of the two reports, and especially in view of the fact that the bacteriological examination of August 9th showed the water to contain "intestinal bacilli," and to be "dangerous to public health," I am requested by our Board of Commissioners to communicate with you and ask that you will cause a sanitary inspection to be made of our water supply, surroundings, sheds, etc., and that you will give us the benefit of your advice in this important matter. The water supply company is not inclined, at the present time, to institute measures for the improvement or purification of the supply, and yet there is a widespread impression among many of us that the water is impure, and that we should have furnished a better supply. I shall be very glad to hear from you about this matter. I am,

Yours very truly,
J. H. TUCKER,
Superintendent of Health.

RALEIGH, December 11, 1896.

Dr. J. H. Tucker, Superintendent of Health, Henderson, N. C.

MY DEAR DOCTOR:—In reply to yours of 9th instant, I regret to inform you that the Board's appropriation for the current year is exhausted, and that in consequence it will be impossible to grant the request of your town commissioners for a sanitary inspection of your water supply. The question of water supplies in our State is for the most part a serious one. The water is in most instances taken from a small stream fed from an inhabited and cultivated watershed. With such a source it will be very difficult to prevent the infection of the water at one time or another—certainly as the water companies generally manage it. I have thought a great deal about it, and it seems to me that the only way to do it is to have the watershed thoroughly policed by an officer who shall devote his entire time to it. It is important, of course, to have the water frequently examined, but when it is found to be contaminated it is too late, the damage has already been done. The thing to do is to prevent the contamination. Leaving out the question of the public health, I believe the money paid to a reliable man—say $500 a year—would more than pay the water company in the increased confidence in the water on the part of the community.

Whether, in case of an epidemic clearly traceable to the public water supply, a suit for damages would lie against the water company if it had failed to take all reasonable precautions to protect the water, I do not know, but it ought to. Please think this matter over carefully and give me the benefit of your valuable opinion.

I enclose a permit for another chemical examination, and I would thank you to take the sample on the 20th, in accordance with the request of Mr. Bridgers, who, for some reason which he does not mention, thinks the water would make a better showing about that time in the month. Can you tell me why? Or will you ask him to do so? Oblige me further by showing him this letter, returning to him the copy of Dr. Venable's analysis and asking him to consider this a reply to his letter of the 7th, as I have so much to do at this season on account of the preparation of my biennial report. Let me hear from you.

Very truly yours,
RICHARD H. LEWIS, *Secretary.*

NEW BERN.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., September 2, 1896.

Dr. J. W. Duguid, Superintendent of Health, New Bern, N. C.

DEAR SIR:—I have the honor to submit the following report of the sample of water collected and sent by you on 29th August, 1896. A quantitative bacteriological examination shows 112 bacteria colonies to the cubic centimetre. Were it not for some evolution of gas in the fermentation tube, I would consider the water good, and were all the bacteria of benign form. But as this test throws some doubt upon the purity of your water, it would be advisable to have both a quantitative and qualitative analysis made soon. If you have much typhoid fever among those who use your water, the sooner this analysis is made the better.

Respectfully submitted,
ALBERT ANDERSON.

P. S. DEAR DR. LEWIS:—Since sending my report to Dr. Duguid, he writes me that there has never been a case of typhoid fever among those who drink this water. It is not necessary, therefore, to examine this again right away.

RALEIGH, N. C., October 6, 1896.

Dr. J. W. Duguid, Superintendent of Health, New Bern, N. C.

DEAR DOCTOR:—From Dr. Anderson's report of his recent bacteriological examination of the public water supply of your city I learn that there is some doubt about its safety. Drinking water should be like Cæsar's wife—above suspicion—and no water containing fermenting bacteria, which means, as I understand it, bacteria belonging to the colon group, can claim that distinction. The fact that no cases of typhoid fever have been traced to it is no guarantee, if it is contaminated with human excrement, that it will not receive that poison and precipitate an epidemic on a large scale. You are doubtless familiar with the famous Plymouth epidemic. I would therefore urge upon you the importance of having the water company undertake at once a thorough examination of the water, and either dispel the doubt or confirm it and set about remedying the trouble.

Please let me know before the 14th what is proposed to be done, as the Board meets on the 15th.

Very truly yours,
RICHARD H. LEWIS, M. D.,
Secretary.

No reply was received to this letter.

A letter from Dr. Anderson dated December 8th, in reply to one of inquiry states that Dr. Duguid, the Superintendent of Health (for reasons not given, but doubtless sufficient), had "instructed Dr. ——— to attend to sending the sample and I sent ——— the bottle, but have not heard from him. Will examine the sample whenever it comes." In a second letter dated December 24th, Dr. Anderson says, "I have not been able to get another sample from New Berne."

RALEIGH.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., September 28, 1886.

Dr. James McKee, City Superintendent of Health, Raleigh, N. C.

DEAR SIR:—I have the honor to submit the following report of the bacteriological examination of sample of water which you sent me 12th September, 1896, collected from the public water supply of your city, drawn from faucets at water tower. The average number of bacteria colonies to the cubic centimetre was 125. This number of the benign form would indicate the water to be good, but some of the tests showed that the sample contained intestinal bacteria. These bacteria produce an evolution of gas formation in glucose-bouillon, and in my fermentation tube containing this medium there was fermentation, producing a collection of gas at the top of the tube, into which had been put three drops of water. There is an acid formed in process of fermentation, produced by the presence of intestinal bacteria, and colonies of intestinal bacilli will be red in culture upon a blue culture medium. Lactose-litmus agar is a medium of this color, which I used and obtained red colonies, thereby getting an additional proof of intestinal bacteria in the water. I took a pure culture from one of these red colonies, and streaked it upon sterilized potato, and got the characteristic growth of this germ. The source of contamination shou'd be removed at once, as the typhoid bacilli and the above are frequently associated.

Respectfully submitted,
Duplicate. ALBERT ANDERSON.

RALEIGH, N. C., October 10, 1896.

R. H. Lewis, M. D., Secretary North Carolina Board of Health,
Raleigh, N. C.

DEAR SIR:—Replying to yours of 6th instant, will state that I have seen the authorities of the Raleigh Water Company and they have assured me that there shall be no delay in applying the promptest remedies to relieve the evil ascertained by the bacteriological examination of specimen sent on September 12, 1896.

I was astonished at the result of the examination, for I am at a loss to know where the bacillus coli communis came from. Thirty days ago a specimen was obtained and sent to the same bacteriologist, who failed to find anything of the kind. There are no surface privies on the shed and no sewage whatever is emptied into the stream. I shall, on Monday, inspect the watershed from the source of the stream in Cary to the intake and have abated promptly, as far as possible, any nuisance on it likely to contaminate the water supply. The Water Company is as ready to remove the evil as the Board of Health is to demand it.

Very truly yours,
JAMES McKEE, M. D.,
City Superintendent Health.

RALEIGH, N. C., October 30, 1896.

Dr. R. H. Lewis, Secretary North Carolina Board of Health,
Raleigh, N. C.

DEAR SIR:—Inclosed is a copy of the report of the analysis of the water from the city's water supply, made by Dr. A. C. Abbott, in the Laboratory of Hygiène at the University of Pennsylvania. You will observe that the qualitative examination differs from that made by Dr. Albert Anderson, the bacteriologist of Wilson, N. C. Dr. Anderson's examination reveals the presence of intestinal bacilli, and Dr. Abbott's does not. A glance at the mortuary record of the city shows that there have been very few intestinal disturbances registered as the cause of death and fewer cases of typhoid fever reported by the physicians than usual, and I am told by the superintendent of the water company that there has been a very marked increase in the water consumers. These facts show that the water cannot be anything but healthy.

Commending your Board for their interest in the matter of healthful water supplies in the various towns in North Carolina, I am,

Very respectfully,
JAMES McKEE, M. D.,
President City Board of Health.

PHILADELPHIA, Pa., October 17, 1896.

Dr. James McKee, President Board of Health, Raleigh, N. C.

DEAR SIR:—We give below the report of the analysis of the sample of water received by express from you October 14th. Both quantitative and qualitative examinations were made. The quantitative tests gave a small number—only 236 bacteria per cubic centimeter.

The qualitative examination revealed no organisms whatever of a suspicious nature. Yours truly,

(Signed) A. C. ABBOTT.

SALEM.

REPORT OF BACTERIOLOGICAL EXAMINATION.

To Dr. Bahnson, Salem.

The sample of water collected by you September 2d from the public water supply of Salem contains 1,200 bacteria to the cubic centimetre of water. It does not contain intestinal bacilli, but does contain proteus vulgaris. This sample was shipped without ice, and it is probable that the number of bacteria in it was greater when plated than when fresh taken.

Yours truly,

Duplicate. W. T. PATE.

SALISBURY.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., September 30, 1896.

Dr. John Whitehead, Superintendent of Health, Salisbury, N. C.

DEAR SIR:—I have the honor to submit the following report of the bacteriological analysis of sample of water which Dr. McKinzie collected and sent to me September 18, 1896, from the public water supply of your city. A quantitative analysis and a few tests used in a qualitative examination show your sample to be good drinking water. There were only 121 bacteria to the cubic centimetre and only water containing over 400 bacteria of the benign form should be regarded with suspicion.

Respectfully,

ALBERT ANDERSON.

Duplicate.

WILMINGTON.

REPORT OF BACTERIOLOGICAL EXAMINATION.

GIBSON STATION, October 12, 1896.

To Dr. Shepard, Wilmington.

The sample of water collected by you from the public water supply of Wilmington, September 22, contains 3,600 bacteria to the cubic centimetre. These bacteria are all benign forms. The number in this sample is considerably less than in the sample collected by Dr. Harris last February 3, but is still entirely too high for good drinking water.

Yours truly,
W. T. PATE.

WILSON.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., August 27, 1896.

Dr. Nathan Anderson, Superintendent of Health, Wilson, N. C.

SIR :—In making a quantitative bacteriological analysis of the sample of water collected by you on 25th instant, I find only 154 bacteria to the cubic centimetre. This with other tests shows that the water from the city water system is good.

Respectfully submitted,
ALBERT ANDERSON.

Duplicate.

WINSTON.

REPORT OF BACTERIOLOGICAL EXAMINATION.

To Dr. Bynum, Winston.

The sample of water collected by you September 2, from the public water supply of Winston, contains 3,150 bacteria to the cubic centimetre of water. It ferments both glucose and lactose bouillon, but I was unable to isolate the fermenting bacteria. I consider the water suspicious.

Yours truly,
Duplicate. W. T. PATE.

LETTER FROM DR BYNUM TO THE SECRETARY OF THE BOARD.

WINSTON, N. C., September 19, 1896.

DEAR DOCTOR :—A few days since I sent to Dr. W. T. Pate a sample of drinking water from our city water supply. He says it contains 3,150 bacteria to the cubic centimeter, but says he was unable to isolate the bacteria, and says he considers our supply *suspicious*. Our water is sent into the city from two different wells and a supply pond, making three different sources. I would like to have the privilege of sending three different samples that I may locate the trouble. Also, I would like to have a sample of ice from our ice factory examined, and if you consent to this, instruct me in regard to whether the ice must be melted here.

There has been a great deal of complaint about the water used in making this ice, and I cannot catch up with the manufacturers by asking for a sample of this water. Please give me an early reply and oblige,

JOHN BYNUM,
Health Officer.

RALEIGH, N. C., September 25, 1896.

Dr. John Bynum, Health Officer, Winston, N. C.

MY DEAR DOCTOR:—On my return from the meeting of the American Public Health Association I found your letter of 10th inst.

I note your request for four bacteriological examinations of the three sources of your water supply, and of the ice manufactured in your town. I regret that we cannot grant it, for the reason that the appropriation made to the Board is too small to justify the expense. The intention of the Board in ordering a single examination of each of the municipal water supplies of the State was to ascertain for itself if the different water companies were furnishing good and safe water or not to the people, and if not to notify them of the fact and call upon them in the interest of the public health to promptly remedy the trouble. Should any municipal or private water company fail to do so after notice, it would become the duty of the Board to inform the people as to the character of the water furnished them. It goes without saying what the effect of such information would be upon the business of the company. You will therefore transmit to the company furnishing water to your city a copy of Dr. Pate's report, notify it of the position of the Board on the subject, as above stated, and see that a thorough investigation is instituted at once. If this investigation should show the water to be contaminated, steps must be taken immediately to purify it. You would oblige me by letting me know as soon as possible what action in the premises the company proposes to take.

It is unnecessary, of course, for me to suggest that your duty as Health Officer calls for prompt and energetic action on your part.

Hoping to hear very soon that the investigation has been begun, I am,

Very truly yours,
RICH'D H. LEWIS, M. D.,
Secretary.

RALEIGH, October 6, 1896.

Dr. John Bynum, Health Officer, Winston, N. C.

DEAR DOCTOR:—Not having heard from you in reply to my letter of 25th ultimo, I write to ask what steps have been taken by those in authority looking to a thorough investigation of the quality of your public water supply—an investigation rendered immediately necessary by the suspicion of its safety caused by the bacteriological examination of Dr. Pate. I would very much appreciate a prompt and detailed reply so that I may be able to report progress to the meeting of the Board which takes place at Charlotte on the 15th instant. By the way, can't you attend our "Health Conference" there on that day? I am sure you would find it interesting and valuable.

Very truly yours,
RICH'D H. LEWIS, M. D., *Secretary.*

No reply to this was received. It should be said, however, in justice to Dr. Bynum, that information from Dr. Pate is to the effect that he has, in correspondence direct with the latter, shown a laudable interest in the matter.

REPORT ON WINSTON WATER SUPPLY BY J. C. CHASE, ENGINEER OF THE BOARD, MADE OCTOBER 19, 1896.

A large proportion of the water furnished by the public supply is impounded surface water, the balance being derived from two large wells, which were the original source of supply. The surface water supply comes from a small stream fed by several smaller branches, whose sources are numerous springs of varying size.

This water in its normal condition is of attractive appearance and has been assumed to be of satisfactory quality. At times of heavy rains the water becomes very turbid, and at such times the flow of the stream is not allowed to pass into the storage basin.

To still further insure the purity of the supply it is filtered by one of the mechanical devices which are now in quite common use and generally doing excellent work.

The water-shed from whence the supply is derived is quite sparsely settled, and the general presumption would be that the water would ordinarily be free from general pollution. It has been assumed, and with some show of reason, that anything of a detrimental nature would not be likely to find its way into the water-courses, except at times of heavy rainfall, at which time, as before mentioned, the storm water is caused to pass by the storage basin until the water runs clear, by which time it is assumed that any probable pollution has been washed away.

A recent bacteriological analysis of the water arousing some suspicion as to its being free from pollution, it was deemed best to have a thorough inspection of the water-shed, which was made by the writer, accompanied by Mr. J. O. Magruder, Superintendent of the Water Works. With one exception, nothing was found that calls for specific mention. On one of the small feeders of the main stream a house is so situated that apparently a large portion of its daily increment of filth easily finds its way into the water course, which would be likely to account for the suspicious results of the analysis.

It is considered highly desirable that this dwelling should be removed, if possible ; if not, the feeder which it contaminates should be eliminated from the main supply, which can very easily be done. It is quite probable that other feeders will have to be dispensed with in due time, when the water-shed has become more thickly settled, in order to assure a reasonable degree of freedom from pollution. It would be far more desirable, however, for the city to acquire the greater portion, if not all of the territory, for it is believed that in this way only can the future integrity of the supply be assured. It would be advisable to have analyses made of the various small streams tributary to the large one, in order to determine from whence the suspected pollution comes.

Respectfully submitted,
JOHN C. CHASE.

WINSTON, N. C., December 15, 1896.

Dr W. T. Pate, Gibson, N. C.

DEAR SIR:—Dr. Bynum sends you a sample of water from the tap this p. m. This sample is on the part of the State, and is taken after I have disposed of the little well and the north-east branch, both of which showed objectionable matter.

Am sorry we could not send this sooner, but have just gotten the branch turned away, and hope this will reach you in time and show a good analysis for your final report.

Yours truly,
J. O. MAGRUDER,
City Engineer and Supt. Water Works.

GIBSON STATION, N. C., December 28, 1896.

Duplicate for Dr. Lewis.

DR. BYNUM:—Examination of sample sent by you December 15th, marked number 6, from tap public water supply of Winston, finished.

Sample clean. No sediment. Number of bacteria to the cubic centimetre of water, 420. No fermentation in glucose or lactose bouillion. The water very good.

Yours truly,
W. T. PATE.

In his letter accompanying above report Dr. Pate says: "These people seem to have made an honest effort to get safe water. I have examined five samples for the city, one from each source of supply and one of ice. I enclose Magruder's last letter."

OTHER WATER SUPPLIES.

OXFORD ORPHAN ASYLUM.

The letters referred to in the Secretary's letter below are not printed because they are quite long and deal largely with other matter than the subject in hand. The portion relating to the water supply is recapitulated in the Secretary's reply:

RALEIGH, N. C., September 7, 1896.

Captain C. B. Benson, Secretary Board of Public Charities, Raleigh, N. C.

MY DEAR SIR:—In reply to your communication enclosing letter from the Superintendent of the Oxford Orphan Asylum in regard to three cases of typhoid fever among the children, and transmitting request from his Excellency the Governor, that a bacteriological examination be made of the water supply, I beg to say: From the small number of cases among so many using the same drinking water I hardly think that the source of the infection is there, but in some other well or spring from which they probably drank. I have, however, with pleasure, in compliance with the Governor's request, sent a permit for a bacteriological examination to Dr. Booth, the County Superintendent of Health of Granville county. When the report is received I will send you a copy.

The Board of Health has ordered a sanitary inspection made of all the State institutions and the Asylum for orphans will be visited in common with the others. I will also take pleasure in sending you a copy of the report of the visiting committee when it is made.

Very truly yours,
RICHARD H. LEWIS, M. D.,
Secretary.

WILSON, N. C., November 30, 1896.

Dr. T. L. Booth, Superintendent of Health, Oxford, N. C.

DEAR SIR:—Every test used in the bacteriological examination of the sample of water which you sent me shows it to be bad and unfit for use. There were so many colonies of bacteria to the cubic centimetre that I could not count them accurately. The coagulation of milk, formation of gas in fermentation tube, characteristic growth on potato, and a decided fecal odor, are sufficient tests to mention to show that the water is contaminated with intestinal bacilli. You should at once remove the source of contamination or prohibit use of the water.

Respectfully submitted,
ALBERT ANDERSON.

RALEIGH, N. C., December 7, 1896.

Dr. T. L. Booth, Superintendent of Health, Oxford, N. C.

MY DEAR DOCTOR:—I have just received the report of Dr. Anderson on the bacteriological examination of the water of the well at the Orphan Asylum. It shows the water to be dangerously polluted with intestinal bacilli. As the asylum has another and better water supply I would advise its being filled up. Please let me know what action has been taken by the authorities of the institution. I am informed that he sent them a copy of the report sometime ago.

Very truly yours,
RICHARD H. LEWIS, *Secretary.*

OXFORD, N. C., December 10, 1896.

Dr. R. H. Lewis, Raleigh, N. C.

MY DEAR DOCTOR:—Your letter relative to the well at the Oxford Orphan Asylum just received. In reply I beg leave to say that its use has been discontinued, and it is so closed that no water can be taken from it, and there has been no new case of fever, of any type, at the asylum since its discontinuance.

Very truly yours,
T. L. BOOTH,
Superintendent of Health.

In a personal interview with Dr. Booth since the above report was made, he informed the writer that in addition to the three cases of typical typhoid fever referred to there had been in the institution many other cases of continued fever of a more or less mild form, nondescript and atypical in character. It is more than probable that the contaminated well water was at the bottom of the trouble.

For an account of the present sanitary condition of the Asylum in the matter of water supply, as well as in other respects, the interested reader is referred to the report of Mr. Chase, the Engineer of the Board of Health, which will be found under the head "Reports on Public Institutions."

EASTERN HOSPITAL WELLS.

GOLDSBORO, N. C., December 6, 1895.

R. H. Lewis, M. D., Secretary State Board of Health, Raleigh, N. C.

DEAR DOCTOR:—I herewith enclose analysis of water from two wells at this Hospital. One well is 8 inches in diameter and 570 feet deep, and the water is remarkably clear and not unpleasant to the taste. The other is a driven well, some 20 feet deep, and has been in use for a number of years. An analysis was made of it by Prof. Venable five years ago; but I thought proper to have another one made, as percolation in the interim might have changed the solid constituents of the water. The deep well referred to has been completed quite recently, and I deem the water an improvement on the water of another deep well bored two or three years ago. I will thank you for any criticism you may make on the water predicated upon the analysis. We purpose using the water for all purposes. Please return these analyses by Monday's mail, as I wish to present them to my directory, which will meet on morning of 12th inst.

Yours very truly,
J. F. MILLER,
Superintendent.

RALEIGH, N. C., December 9, 1895.

Dr. J. F. Miller, Superintendent Eastern Hospital, Goldsboro, N. C.

MY DEAR DOCTOR:—Your letter enclosing copies of chemical analyses of the water from your two wells duly received. Chemically the water from the shallow well is good. That from the deep well, however, has entirely too much free ammonia. At the same time it can hardly be dangerously contaminated. It not infrequently happens that water from deep wells has a high percentage of free ammonia. I cannot understand why there should be so much. Is it possible that the bottle in which the sample was sent was not perfectly clean? I would suggest that you send another sample of the deep well water in a new bottle. I would also suggest that you have a bacteriological examination made of both. It would be made for you by Dr. Anderson, of Wilson, for $10 each. We cannot afford to pay for it out of our small appropriation, under the circumstances, but you can. I enclose permits which will give you the lower rate. Let me hear from you again.

Very truly yours,
RICH'D H. LEWIS, M. D.,
Secretary.

ASHEVILLE WELL WATER.

ASHEVILLE, N. C., June 15, 1896.

Dr. R. H. Lewis, Raleigh, N. C.

DEAR DOCTOR:—Please inform me if our State Board of Health has the means at its disposal for the bacteriological examination of water? If so I wish to have a culture made for Eberth's Bacillus from a water supply that has developed from two to five cases of typhoid fever annually for the past eight years.

Fraternally yours,
JAMES A. BURROUGHS.

WILSON, N. C., August 1, 1895.

MY DEAR DR. LEWIS:—I have made report to Dr. Burroughs on the Asheville water. Dr. Pate very kindly offered to examine a sample of this water with me, and we have made both a quantitative and qualitative examination. Pate found 1,250 colonies to the cubic centimetre, and I, 1,600; great evolutions of gas, fecal odor, red or pink colonies on lactose-litmus-agar, and indol production. The above shows the water decidedly unfit for use. Pate and I have succeeded in isolating a bacillus that has the microscopic appearance and cultural peculiarities of the Coli Communis. But our quantitative examination about established this. I had one potato growth that resembled the typhoid, and every additional test I've yet tried did the same. If I get one or two others I shall believe it to be the Eberth's Bacillus.

Very sincerely yours,
ALBERT ANDERSON.

WELL IN BURLINGTON.

BURLINGTON, N. C., August 14, 1890.

Dr. Richard H. Lewis, Secretary State Board of Health,
Raleigh, N. C.

MY DEAR SIR:—Typhoid fever is prevailing to an alarming extent in one portion of our town. It is of a very malignant and fatal type. It is evident that there must be some local cause for it, and unless it is the drinking water from the wells we cannot tell what the trouble is. I write for a permit to have a bacteriological examination of the water from several of the wells in the locality of the disease.

Very respectfully,
R. A. FREEMAN,
Superintendent of Health for Alamance County.

Owing to the small appropriation to the Board, a permit for only one bacteriological could be sent. Permits for two chemical analyses, which are kindly made for the Board free by the director of the State Experiment Station, were also given. For the latter the reader is referred to the tabulated statement of all the chemical analyses for the biennial period, which concludes the subject of water supplies.

REPORT OF BACTERIOLOGICAL EXAMINATION.

WILSON, N. C., August 24, 1896.

Dr. R. A. Freeman, Superintendent of Health, Alamance County,
Burlington, N. C.

SIR:—I have the honor to submit the following report of the bacteriological examination of the sample of water collected and sent me by you August 19, 1896.

The examination shows about 5,000 bacteria to the cubic centimetre. There was a maximum amount of evolution of gas formation in fermentation tube. On the second day there was coagulation of milk inoculated by the water. The unusually large number of bacteria to the cubic centimetre is due in part to the hot weather, and the sample not being packed in ice and saw dust. From the above tests I would consider the water from which sample was taken unfit for use.

Respectfully submitted,
Duplicate. ALBERT ANDERSON.

WELLS SHOWING UNUSUAL FORMS OF CONTAMINATION.

During the year 1896 three samples of water containing living organisms visible to the eye were sent in for examination. That class of work not coming within the scope of either the chemist or the bacteriologist they were submitted to Dr. H. V. Wilson, the Professor of Biology in the State University, who kindly examined for us. His reports on the three specimens appear below.

For the benefit of the reader who is no better acquainted with entomology than the writer, it may not be amiss to roughly describe the general appearance of the several "bugs," "worms" or "things" as they were variously denominated by the gentlemen sending the specimens.

The insects in the water sent by Dr. H. J. Thomas, of Winston, were from a quarter to a third of an inch in length and were very much like miniature shrimp.

Those from the well in Oxford, sent by Mr. A. J. Field, were too minute to make out the details with the unaided eye. Under the microscope, however, they presented more the appearance of a flea than any other familiar insect, having long and evidently strong hind legs. Their resemblance to the flea was completed by their jumping on the surface of the water. They seemed to live on the surface, and in quantities suggested the idea of fine sawdust on top of the water.

The organisms in the specimen from Dr. C. M. Poole, of Craven, were like small worms.

DR. WILSON'S REPORT.

CHAPEL HILL, November 17, 1896.

MY DEAR DOCTOR LEWIS:—The water from Oxford has not yet turned up. I should like to have it, and will be glad to examine the bugs.

The Winston water reached me. It contained Amphipod crustacea, belonging to the genus *Crangonyx*. Owing to lack of literature I cannot give the species, if indeed it has ever been described.

The bugs, however, differ only in a few points from *Crangonyx tenuis*, a species described as occurring in wells in Middletown, Conn. Another species of the same genus has been found in wells in Indiana. The amphipods are not poisonous, and the *Crangonyx* probably does no harm to the water. Its presence, however, indicates the presence of a good many other forms, and the water may, of course, be indirectly affected by their death.

Without knowing much about the matter practically, I should think the only way to get rid of the beast would be to thoroughly clean the well, say now (at the beginning of the breeding season) and at least once during the summer. The object in cleaning should be not only to get as many of the amphipods themselves as possible, but to destroy their food supply. And therefore every bit of plant-life (green incrustation probably present) should be removed by a thorough scraping—scrapings, of course, must be removed from well.

I should like some more specimens (two or three dozen, if possible) for the University Museum, and would be greatly obliged if you would ask that they be sent me. Am always glad to get "bugs" of any kind.

Yours very truly,
H. V. WILSON.

WELL IN OXFORD.

CHAPEL HILL, N. C., March 28, 1896.

MY DEAR DR. LEWIS:—I received yesterday some water from Oxford sent at your request. The sender's name was on the wrapper, but this has been mislaid. The water contained an abundance of "spring-tails" belonging to the genus *Podura*. The spring-tails are very simple and wingless insects. Will you let the gentleman in Oxford know what the bugs are?

Yours very truly,
H. V. WILSON.

WELL IN CRAVEN.

CHAPEL HILL, N. C., June 8, 1896.

MY DEAR DR. LEWIS:—The "worms" received from Dr. C. M. Poole and reported as occurring in a well near Craven, N. C., are the larvæ of an insect *Chironomus*, a gnat or midge about the size of and much like the common mosquito. This insect only breeds in stagnant and more or less foul water. Its presence alone in the well would indicate that the water is unfit for use. The people using the water from this well have, according to Dr. Poole, suffered from typhoid, &c. As illustrating the habitat of the form, I may mention that it is extremely abundant in a small stream below the campus into which the drain from the dissecting hall leads. But it is not found at all in a clear stream opening into the above, even quite near the point where the two streams meet.

The midge is reported as breeding from April into the fall. I have found the larvæ in April.

Yours very truly,
H. V. WILSON.

CHEMICAL ANALYSES MADE FOR THE BOARD BY THE STATE EXPERIMENT STATION.

NO.	NAMES.	ADDRESS.	Total Solids.	Hardness.	Chlorine.	Carbonate of Lime.	Ammonia, Free.	Ammonia, Albumnoid	LOCATION.
9148	Dr. A. W. Goodwin	Raleigh, N. C.	41.50	....	12.50	12.00	.138	.100	Well E. Hargett Street.
9209	Dr. W. W. McKenzie	Salisbury, N. C.	10.33	....	0.41	3.00	.056	.094	Salisbury Water Works.
9218	J. L. Williamson	Cerro Gordo, N. C.	8.83	....	1.16	4.66	.066	.076	Driven Well.
9226	T. H. Bain	Goldsboro, N. C.	4.17	....	.58	50	.04	.16	Little River.
9270	H. E. Knox, Jr.	Charlotte, N. C.	22.41	....	1.33	1.00	.136	.088	Artesian Well, Mill Number 1. Hope Mills.
9436	H. E. Knox, Jr.	Charlotte, N. C.	2.33	1.85	0.17	0.71	.170	.132	Tube Well, Sanford.
9457	A. J. Field	Oxford, N. C.	11.17	6.10	2.58	4.25	.214	.118	Well in Oxford.
9592	Roanoke Rapids Power Company.	Roanoke Rapids, N. C.	3.03	2.50	0 70	0.90	.154	.142	Well in Hamilton Street.
9745	W. N. Smith	Tarboro, N C.	12 08	1.20	0.58	0.17	.058	.086	Well in Tarboro.
9792	E. S. Cox	Jacksonville, N C.	28.00	14.50	0.90	11.20	.34	.17	Well near Jacksonville.
9881	Dr. R. J. Brevard	Charlotte, N. C.	4.17	2.30	0.83	1.08	.666	.046	Charlotte Water Supply.
9882	H. E. Knox, Jr.	Charlotte, N. C.	9.66	8.40	0.08	6.17	.032	.048	Artesian Well, Lumberton.
9919	F. O. Lawson	Wadesboro, N. C.	120.58	68.30	61.25	56.08	.05	.114	Well in Wadesboro,
9923	Dr. J. H. Tucker	Henderson, N. C.	3.50	1.10	0.08	0.08	.136	.212	Hydrant, Railroad Square.
9924	Dr. W. J. Jones, Jr.	Goldsboro, N. C.	4 25	1 00	.08	0.00	.018	.146	Robinson's Drug Store.
9927	B. F. Keith	Wilmington, N. C.	1.83	1.00	0.25	0.00	.042	.068	Pump, northern part of city.
9928	B. F. Keith	Wilmington, N. C.	18.41	6.70	2.00	4.75	.042	.074	Well, central part of city.
9929	R. W. Orr	Statesville, N. C.	5.92	1.10	2.66	.08	.111	.116	High hill near city.
9930	H. E. Knox, Jr.	Charlotte, N. C.	9.08	6.50	0.25	4.56	.066	.066	Well, Lumberton.
9931	H. E. Knox, Jr.	Charlotte, N. C.	8.78	8.10	0.16	5.92	076	.062	Well, Lumberton.

MALARIA AND DRINKING WATER.

In the appendix of the last Biennial Report there was printed as a part of the proceedings of the Salisbury Health Conference, a paper read before that meeting by the Secretary of the Board entitled "Drinking Water in Its Relation to Malarial Diseases." It was published in *The Sanitarian* and attracted attention all over the country, receiving editorial consideration in some of the great New York dailies, *The Independent*, the Baltimore *Sun*, the St. Louis *Globe-Democrat*, the Charleston *News-Courier*, and others. By order of the Board it was reprinted in separate form and in 1895 was distributed as one of the health pamphlets.

Wishing to ascertain if any good had been accomplished by it, the following circular letter was mailed to several hundred physicians residing in the eastern section of the State:

RALEIGH, December 7, 1896.

DEAR DOCTOR:—Not quite two years ago the Board distributed throughout the State, particularly the eastern part, a pamphlet on "Drinking Water in its Relation to Malarial Diseases" in which the dangers of surface water, as from the ordinary wells of that section, were set forth, and a change therefrom to cisterns, deep bored wells, or driven pumps advocated. The Board now desires to ascertain if its efforts in that direction have borne fruit. Will you, therefore, kindly answer the following questions in the spaces allowed and return to me as soon as possible?

1. To what extent, as near as you can come at it, has the suggested change in drinking water taken place in your community?

....

....

2. What has been the effect of the change in preventing malarial attacks?

....

....

....

3. Do you think any lives have been saved by making the change?

....

....

4. Which has been the most effective, cistern, bored well or driven pump?

....

....

5. Have you ever known of a case of hemorrhagic malarial fever or of pernicious malarial fever in a person rigidly and absolutely confining himself to—cistern water? Bored well? Driven pump?

....

....

By devoting a few minutes to answering these questions you would greatly oblige the Board of Health, do a service to the people of your State, and advance the cause of science. Will you do it?—and promptly?

Very truly yours,

RICH'D H. LEWIS,

Secretary.

Fifty-six replies only have been received up to the time of this writing. The answers in many instances are of such a character as to render their satisfactory tabulation impossible, but the showing, on the whole, is encouraging.

In reply to question No. 1. "To what extent, as near as you can come at it, has the suggested change in drinking water taken place in your community?" nineteen stated that the change had been considerable—from 10 per cent. up to over 50 per cent.; seven that there had been some change; fifteen a little, and nine none. Deep bored wells were mentioned by only two, cisterns, prominently, by not more than half a dozen, the change in most instances being to driven pumps.

To question 2. "What has been the effect of the change in preventing malarial attacks?" seventeen answers were classed as very good, nine good, three slight and five none.

To question 3. "Do you think any lives have been saved by the change?" seventeen answered yes, decidedly; four yes, positively but less forcibly; three yes, doubtfully, and two positively no.

To question 4. "Which has been the most effective, cistern, bored well or driven pump?" in every case where a comparison between them could be made the replies were in favor of cisterns first and bored wells next. It is true that in one instance the writer stated that driven wells were "more satisfactory" than cisterns but in what respect he did not say and it is not unlikely that a want of the proper care of the cisterns, which were very few in number, was at the bottom of the preference for driven pumps.

The replies to question 5. "Have you ever known of a case of hemorrhagic malarial fever, or a pernicious malarial fever in a person rigidly and absolutely confining himself to—cistern water? Bored well? Driven pump?" were all in the negative except six who had known of such cases in persons drinking the water of driven wells. In these cases most of the wells in the community being open surface wells, it is not unreasonable to assume that those attacked did not rigidly and absolutely confine themselves to driven pump water. It should also be said that in a great many instances the driven wells are quite shallow. From the best information in our possession they do not average more than 25 feet in depth and therefore really furnish surface water, although it must, of necessity, undergo a more thorough filtration through the soil than that of open wells.

Although the evidence as given above is somewhat crude and imperfect, it is plain that marked interest in the subject of better drinking water has been aroused among the people and that very many have been led to make a change in that respect to the great improvement in their health, so far as malarial diseases, at any rate, are concerned, and the saving of many lives, and this is but the beginning of the movement in this direction and in the near future we can look for much greater results. The Board has sown the seed and a richer and richer harvest may be expected every succeeding year.

THE SERUM DIAGNOSIS TEST FOR TYPHOID FEVER.

The impossibility of making a certain diagnosis in the early stages of many cases of typhoid fever has been a stumbling block in the management of that most serious and wide-spread disease until quite recently. Pfeiffer, of Berlin, discovered the fact that an admixture of the serum of the blood of a person sick with typhoid fever with a pure culture of the bacillus typhosus, which is a motile bacillus, would check their movements in a very few minutes—kill them in other words. Widal, of Paris made the practical application of this fact to the diagnosis of the disease in the human being. Within the past six months Dr. Johnston, the Bacteriologist of the Board of Health of the Province of Quebec, has so simplified the method that it is now within the reach of any physician. He demonstrated at the meeting of the American Public Health Association, at Buffalo, in September, 1896, that a single drop of the dried blood of a typhoid patient was all that was necessary to enable any bacteriological having the proper apparatus to make the diagnosis, so that the physician in doubt about a case could have his doubts removed by mailing a drop of the dried blood to the nearest bacteriologist. On his return from the meeting referred to above the secretary lost no time in announcing this important fact to the physicians of the State through the columns of the *Bulletin*. He was much gratified to receive shortly thereafter the following letter from Dr. R. H. Whitehead, who is at the head of the Medical Department of the University.

CHAPEL HILL, October 5, 1896.

DEAR DOCTOR:—We have now a very decent little bacteriological laboratory in running order, which I should like to make useful for other purposes than those of mere instruction alone. It has occurred to me that I might try the new test for typhoid—the serum test. Accordingly I should be glad to have you state in your letters to the superintendents and others, that I am prepared to do the work for them. They should receive a large drop of blood on a bit of clean glass from a puncture of the lobe of the ear, allow it to dry, and then send it to me by mail at once, along with the name of the sender and that of the patient. The doctors should also keep a record of the cases so that we may obtain the clinical history afterwards. Then if you liked I could report the results at the next conjoint meeting of the Board with the society. This test would doubtless help to settle the nature of the "simple continued fever."

I would be glad to make the laboratory useful in any other way so far as my time will permit.

Yours very truly,
R. H. WHITEHEAD.

The Board at its meeting in Charlotte, on October 15th, expressed its appreciation of Dr. Whitehead's generous offer and accepted it, at the same time instructing the secretary, as soon as the condition of the treasury would permit, to distribute to all of the physicians in the State a circular letter giving the Doctor's offer and the necessary directions. This has not yet been done, for lack of money to pay the postage.

MARITIME QUARANTINE.

As set forth in the last biennial report, the Board at its annual meeting at Greensboro requested the United States Marine Hospital Service to take charge of and operate the quarantine station at Southport, that Bureau having been authorized by act of Congress to do so. The request was acceded to, and the Government proceeded to install a plant in the way of buildings and appliances adequate to the proper performance of the work of preventing the entrance into the State through that port of infectious diseases of foreign origin. The improvements are now about completed, and although Dr. Curtis, the efficient State quarantine officer, during an incumbency of many years, succeeded, with the extremely limited facilities at his command, in keeping out disease, we can but feel safer with the admirable organization of the Marine Hospital Service, supported by ample appropriations of money, in charge.

On January 26th the following letter, which explains itself, was received:

WASHINGTON, D. C., June 25, 1896.

Richard H. Lewis, M. D., Secretary North Carolina Board of Health, Raleigh, N. C.

SIR:—I have respectfully to request that the pilots bringing vessels to Beaufort, N. C., be directed to bring all vessels from foreign ports, and all vessels from the West Indies, Central and

South America and Mexico, coming via a northern United States port, to a convenient place in Beaufort harbor which will be designated by Acting Assistant Surgeon F. M. Clarke, Quarantine Inspector; said vessels to fly a yellow flag and to be considered in quarantine, as per the laws of North Carolina and the United States, until released by the quarantine officer, Dr. Clarke.

Respectfully yours,
WALTER WYMAN,
Supervising Surgeon General, M. H. S.

The above was transmitted to Dr. George N. Ennett, Superintendent of Health for Carteret county, with the request that he give this information to all the pilots of his county. It was further stated that under the laws of the United States the Marine Hospital Service had control of all these matters and that their orders must be obeyed —that they were good orders.

VITAL STATISTICS.

While our vital statistics continue meagre, reports being made only by cities and towns, an improvement has been made in accuracy, at least for the year 1896. In December, 1885, the reporting cities and towns were notified that they would be divided for the ensuing year into two classes, according to the reliability of their reports. At the bottom of the blanks furnished was printed, "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month," and the signing of this certificate by the reporter placed the report in the first class. The table of mortuary statistics for 1896 is made up only of such reports. The aggregate population of the cities and towns so reporting is

103,501, 56,205 white and 46,496 colored. The few remarks which follow are based on this table.

The total death-rate for the whites was 14.1 and for the colored 24.5 per thousand. The largest number of deaths was from tuberculosis, the death-rate from that disease alone being 1.67 for the whites and 4.47 for the colored people, the proportion being 1 white to 2.67 colored. While tuberculosis is much more prevalent among the negroes living in the towns, it is becoming more and more common in the country districts, and constitutes, as suggested in our last report, a very serious menace to the race. In that report we also adverted to the fact that, contrary to the usually accepted opinion that the negro was less susceptible to malarial diseases than the white man, our reports showed the death-rate from that disease to be two and half to one, as against the negro. This fact has only been emphasized by the more accurate report for 1896, the proportion being 3.33 to 1 during that year. We also called attention to the fact that the negro appeared to be much less susceptible to diphtheria than the white man, the total number of deaths for the biennial period, 1893–'94, being whites 22, colored 0. In 1896 they were 13 and 1 respectively.

A letter has been sent to the mayors of a number of towns which have not heretofore kept mortuary statistics, or at any rate have made no report thereof, urging upon them the importance of keeping such records, and requesting report of the same to be made to this office. It is hoped that they will respond favorably in order that we may have a larger population on which to base our vital statistics hereafter.

TABLE I.—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1895 AND 1896.

Eastern Division (E.)—Alluvial Plains. Central Division (C.)—Hilly. Western Division (W.)—Mountainous. The figures under the various diseases represent in percentage the proportion of the counties mentioning the presence of the disease in question to the whole number of counties reporting for the month.

			Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia.	Scarlatina.	Typhoid Fever.
January.	E.	1895	36	29	6.8	0.0	17.2	10.3	10.3	3.4	34.3	17.2	13.7
		1896		28	3.5	3.5	10.7	14.2	10.7	0.0	25.0	28.5	17.8
	C.	1895	26	25	8.0	4.0	20.0	4.0	0.0	0.0	32.0	8.0	16.0
		1896		23	4.3	0.0	30.4	4.3	0.0	4.3	43.5	8.7	30.4
	W.	1895	34	32	9.4	0.0	6.2	0.0	3.1	0.0	28.1	9.4	21.9
		1896		30	3.3	0.0	20.0	0.0	0.0	0.0	33.3	0.0	33.3
February.	E.	1895	36	29	0.0	0.0	31.0	6.8	13.7	0.0	51.7	13.7	10.3
		1896		28	7.1	0.0	17.8	17.8	14.2	0.0	32.1	7.1	17.8
	C.	1895	26	25	8.0	0.0	28.0	0.0	0.0	0.0	52.0	8.0	8.0
		1896		22	4.5	0.0	22.7	0.0	0.0	0.0	22.7	9.1	22.7
	W.	1895	34	34	2.9	0.0	14.7	0.0	0.0	0.0	35.3	5.6	23.2
		1896		31	3.2	0.0	19.6	0.0	0.0	0.0	25.8	3.2	25.8
March.	E.	1895	36	28	7.1	0.0	35.7	7.1	14.3	3.5	42.8	3.6	10.7
		1896		26	3.8	0.0	30.7	23.1	11.5	0.0	53.8	7.3	26.9
	C.	1895	26	25	0.0	0.0	32.0	8.0	4.0	0.0	44.0	8.0	20.0
		1896		25	8.0	0.0	12.0	4.0	0.0	0.0	28.0	0.0	16.0
	W.	1895	34	33	0.0	0.0	21.2	0.0	0.0	0.0	30.3	6.1	6.1
		1896		26	7.6	0.0	7.6	11.5	0.0	3.8	34.6	0.0	34.7
April.	E.	1895	36	31	6.4	3.2	19.3	19.3	9.6	3.2	16.1	6.4	19.3
		1896		27	0.0	11.1	3.7	33.3	0.0	3.7	7.3	3.7	18.4
	C.	1895	26	25	4.0	0.0	36.0	12.0	0.0	0.0	20.0	4.0	12.0
		1896		24	4.1	8.3	4.1	8.3	4.1	4.1	12.5	0.0	29.1
	W.	1895	34	33	3.0	3.0	15.1	6.0	0.0	0.0	18.1	9.1	12.1
		1896		32	3.1	9.3	3.1	3.1	0.0	0.0	6.2	0.0	31.2
May.	E.	1895	36	31	3.2	22.5	3.2	35.4	3.2	6.4	6.4	9.6	22.5
		1896		28	3.5	42.8	0.0	42.8	3.5	0.0	0.0	7.1	25.0
	C.	1895	26	26	3.8	15.3	19.2	15.3	0.0	0.0	15.3	0.0	7.6
		1896		22	0.0	45.4	0.0	13.6	0.0	4.5	0.0	0.0	40.9
	W.	1895	34	32	3.1	12.5	3.1	15.6	0.0	0.0	3.1	3.1	25.0
		1896		32	3.1	28.1	0.0	9.3	3.1	0.0	3.1	0.0	34.3

TABLE I.—SHOWING COMPARATIVE PREVALENCE.—CONT'D.

			Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia.	Scarlatina.	Typhoid Fever.
June.	E.	1895	36	31	0.0	25.8	0.0	45.1	3 2	3.2	0.0	9.6	29.0
		1896		27	0.0	11.1	66.6	0.0	11.1	0.0	0.0	11.1	55.5
	C.	1895	26	26	3.8	30.7	3.8	26.9	0.0	0.0	0.0	3.8	34.6
		1896		21	4.7	38.1	38.1	0.0	4.7	0.0	4.7	0.0	61.9
	W.	1895	34	33	3.0	15.1	0.0	12.1	0.0	0 0	3.0	6.1	27.2
		1896		32	6.2	25.0	15.6	0.0	0.0	0.0	0.0	3.1	75.0
July.	E.	1895	36	31	3.2	12.8	3.2	54 8	9.6	9.6	0.0	12.8	61.2
		1896		28	7.1	7.1	3.5	75.0	7.1	3.5	0.0	17.8	78.5
	C.	1895	26	26	7 6	34.6	0 0	34.6	0.0	0.0	3.8	11 5	46.1
		1896		22	0.0	0 0	0.0	63.6	0.0	0.0	0.0	0.0	86.3
	W.	1895	34	32	6.2	12.5	0.0	12 5	0.0	0.0	0.0	9.3	56.2
		1896		30	10.0	3.3	0.0	16.6	0.0	3.3	0.0	3.3	83.3
August.	E.	1895	36	30	13 3	10.0	6.6	80.0	13.4	6.6	0.0	16.6	50.0
		1896		26	15.7	0.0	0.0	69.2	30 7	23.1	0.0	0.0	76.9
	C.	1895	26	20	5.0	15.0	0.0	35 0	0.0	0.0	0.0	5.0	85.0
		1896		22	13.6	0.0	0.0	68 1	9.0	4.5	0.0	4.5	95.4
	W.	1895	34	31	9.6	3.2	0.0	19 7	0.0	3.2	0.0	16.1	77.4
		1896		32	18.7	0 0	3.1	28.1	3.1	0.0	0.0	0 0	81.2
September.	E.	1895	36	27	11.1	3.7	0.0	74.1	33 3	11.1	0.0	33.3	44.4
		1896		26	7.6	7.6	0.0	65.3	26.9	7.6	0.0	7.6	53.8
	C.	1895	26	23	4.3	13.0	0.0	56.5	8.6	8.6	0.0	8.6	65.1
		1896		21	19.0	0.0	0.0	61.9	4.7	0.0	0.0	9.5	71.4
	W.	1895	34	32	25.0	3.1	0.0	25.0	0.0	0.0	0.0	18.7	75.0
		1896		30	26.6	3.3	0 0	26.6	6 6	3.3	0.0	13.3	83.3
October.	E.	1895	36	28	10 7	3.5	3.5	75.0	57.1	28.5	0.0	25.0	53.5
		1896		26	7 6	0.0	0.0	73.7	42.3	7.6	0.0	15.3	53 8
	C.	1895	26	24	25.0	4.1	8.3	50.0	4.1	8.3	0.0	12.5	66.6
		1896		21	14.2	0.0	0.0	52.3	4.7	0.0	0.0	9.5	71.4
	W.	1895	34	32	40.6	3.1	12.5	18 7	6.2	6.2	9.3	28.1	75.0
		1896		32	18.7	0.0	6.2	18.7	0.0	0.0	0.0	15.6	78.1
November.	E.	1895	36	27	14.8	3.7	0.0	62.9	29.6	3.7	3.7	25.9	55.5
		1896		28	7.1	3.5	0.0	42.8	17.9	3.5	7.1	17.8	46.4
	C.	1895	26	23	8.6	8.6	0.0	34.7	4.3	13.0	8.6	17.3	43.4
		1896		21	4.7	0.0	9.5	28.5	4.7	4.7	9.5	23.3	42.8
	W.	1895	34	31	29.0	0.0	6.4	9.6	3.2	3.2	9.6	9.6	64.5
		1896		32	6 2	0.0	3.1	15 6	9.3	0.0	9.3	12.5	59.3

TABLE I.—SHOWING COMPARATIVE PREVALENCE.—CONT'D.

			Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Dysentery.	Influenza.	Malarial Fever.	Malarial Fever, Hemorrhagic.	Malarial Fever, Pernicious.	Pneumonia.	Scarlatina.	Typhoid Fever.
December.	E.	1895	36	27	3.7	3.7	7.4	25.9	14.8	0.0	22.2	22.2	37.0
		1896		27	0.0	0.0	7.4	14.8	3.7	3.7	14.8	3.7	25.9
	C.	1895	26	23	8.6	0.0	30.0	8.6	0.0	0.0	26.1	8.6	43.4
		1896		22	4.5	0.0	13.6	4.5	13.6	4.5	22.2	9.1	27.2
	W.	1895	34	30	20.0	0.0	23.3	0.0	0.0	0 0	10.0	3.3	50.0
		1896		31	12.9	0.0	29.0	6.4	3.2	3.2	6.4	6.4	38.7
Averages for the year.	1895	E.	36	29.1	6.7	7.4	10.6	41.4	17.7	6.6	14.7	16.3	39 9
		C.	26	24 2	7.2	11.2	13.6	23.8	1.7	2.5	16.8	7.9	37.3
		W.	34	32.2	12.6	8.5	8.5	9.9	1.6	1.0	12.2	10.4	44.5
	1896	E.	36	27.1	5.2	6.6	11.7	38.2	15.0	5.3	11.7	10.6	39.9
		C.	26	22.2	6.9	7.7	10.0	26.1	3.0	1.9	11.9	6.1	49.6
		W.	34	30 8	10.0	6.6	8.9	11.6	2.1	1.1	9.9	4.8	54.8
	1895	State.	96	28.5	8.8	9.0	10.9	25.0	7.0	3.4	14.6	11.5	38.6
	1896	State.	96	26.7	7.3	7.3	10.2	25.3	6.7	2.8	11.2	7.2	48.1

TABLE II.—SHOWING THE COMPARATIVE PREVALENCE OF DISEASE DURING THE YEARS 1895 AND 1896.

(Of the 96 Counties in the State the number sending reports each month is stated at the head of the columns.)

DISEASES.		NUMBER OF COUNTIES WHICH MENTION THE PRESENCE OF EACH DISEASE EACH MONTH.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1895...	88	89	87	89	89	89	89	83	82	84	81	80
	1896...	81	79	81	82	82	79	80	80	77	79	79	80
Bowel Diseases	1895...	...	1	...	4	12	26	19	10	7	4	1	...
	1896...	...	...	...	11	33	28	13	1	3	...	...	...
Bronchitis	1895...	9	34	14	15	4	...	...	...	1	...	6	9
	1896...	11	13	13	8	...	1	...	...	3	2	2	17
Cholera (Chicken)	1895...	1	...	2	3	1	2	3	2	3	...	...	1
	1896...	3	2	..	1	2	2	4	1	1	...	2	...
Cholera (Hog)	1895...	6	4	4	7	7	7	15	18	12	12	14	8
	1896..	5	3	4	3	3	3	6	3	6	6	12	7
Diphtheria	1895...	7	3	2	4	3	2	5	8	12	22	15	9
	1896...	3	4	5	2	2	3	5	13	14	11	5	5
Distemper, in horses	1895...	1	1	1	1	..	1	...	...	...	...	..	...
	1896...	1	5	2	4	1	2	...	...	...	...	1	2
Dysentery	1895...	1	...	...	2	15	21	17	7	5	3	3	1
	1896...	1	...	...	8	31	19	3	...	3	...	1	...
Influenza	1895...	12	21	25	20	7	1	1	2	...	7	2	16
	1896...	16	16	13	3	...	1	1	1	...	2	3	14
Malarial Fever	1895...	4	2	4	11	20	25	31	37	41	39	28	9
	1896...	5	5	10	12	18	31	40	42	38	36	23	7
Malarial Fever, hemorrhagic	1895...	4	4	5	3	1	1	3	5	11	17	10	4
	1896...	3	4	3	1	2	5	2	11	10	14	9	5
Malarial Fever, pernicious	1895...	1	...	1	1	2	1	3	3	5	10	5	...
	1896...	2	...	1	2	1	...	2	7	3	4	2	3
Measles	1895...	1	2	1	4	3	6	2	2	3	5	9	23
	1896...	45	58	50	48	37	20	10	7	...	1	5	3
Mumps	1895...	1	5	6	3	3	3	3	2	...	1	4	2
	1896...	8	11	12	11	8	2	3	...	1	1	1	3
Pneumonia	1895...	27	40	32	16	7	1	1	...	...	...	6	15
	1896...	27	22	30	7	1	1	...	...	...	3	7	11
Rabies	1895...	...	...	1	2	...	1	...	...	...	...	...	...
	1896...	...	...	...	1	...	1	...	...	...	...	...	...
Rötheln	1895...	...	2	..	1	..	...	...	...	...	2	...	...
	1896...	...	1	1	...	...	...	...	...	...	...	...	1
Scarlatina	1895...	10	8	5	6	4	6	10	11	17	19	14	9
	1896...	2	5	2	1	2	4	6	1	8	11	14	5
Tonsillitis	1895...	1	...	...	...	1	...	...	...	...	2	...	...
	1896...	1	2	...	...	...	...	...	...	...	...	1	1

TABLE No. II.—SHOWING THE COMPARATIVE PREVALENCE OF DISEASE.—CONTINUED.

(Of the 96 Counties in the State the number sending reports each month is stated at the head of the columns.)

DISEASES.		NUMBER OF COUNTIES WHICH MENTION THE PRESENCE OF EACH DISEASE EACH MONTH.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	1895...	88	89	87	89	89	89	89	83	82	84	81	80
	1896...	81	79	81	82	82	79	80	80	77	79	79	80
Typhoid Fever	1895...	15	13	10	13	17	27	49	56	51	55	45	35
	1896...	22	18	20	22	28	52	66	67	54	54	41	25
Varicella	1895...	2	...	...	...	...	...	...	...	...	...	...	1
	1896...	...	...	2	...	2	2	...	1	...	...	...	...
Whooping Cough	1895...	8	12	12	13	9	10	19	18	18	18	14	17
	1896...	19	20	21	20	22	26	21	21	10	14	17	12

TABLE No. III.—TABLE OF MORTALITY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1895.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.													Grand Total.	DEATH-RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
Asheville	W	10	2	13	9	5	9	10	10	6	13	19	5	111	147	15.0	3.0	19 5	12 0	7.5	13.5	15.0	15.0	9.0	19.6	28.5	7.5	13.9	12.2	8,000	12,000
Dr. E. C. Starnes	C	4	5	2	3	2	8	1	4	5	1	0	1	36		12.0	15.0	6.0	9.0	6.0	24.0	3.0	12.0	15.0	3.0	0.0	3.0	9.0		4,000	
Charlotte	W	11	8	8	15	10	17	16	16	13	13	11	16	154	325	14 7	16.7	10.7	22.0	13.3	22 7	21.3	16.3	14 4	14 4	12.2	17.7	14 2	16.5	10,855	19,651
Fred Nash, City Cl'k.	C	12	6	3	14	12	20	16	16	24	24	9	18	171		24 0	12.0	6.0	28.0	24 0	40.0	32.0	24.3	32.7	31 6	12.3	24 6	19.4		8,796	
Durham	W	1	6	1	4	2	2	3	5	4	2	5	4	39	46	2.7	16 0	2.7	10.7	5.3	5 3	8.0	13.3	10.7	5 3	13 1	12.0	9.7	7.7	4,000	6,000
Dr. J. M. Manning	C	1	0	0	3	0	1	0	1	0	1	0	0	7		3.4	0.0	0.0	10.3	0.0	3.4	0.0	3 4	0 0	3.4	0.0	0.0	3.5		2,000	
Fayetteville	W	1	1	4	3	4	4	6	4	3	3	5	5	43	88	4.3	4.3	17.1	12.9	17.1	17.1	25 7	17.2	12.9	12.8	20.0	20.0	14.3	17.6	3,000	5,000
Dr. J. H. Marsh	C	0	4	5	7	2	1	4	5	8	4	3	2	45		0.0	16.4	27.3	38.2	10.9	5.4	21.8	17.3	43.6	21.8	18.0	12 0	22.5		2,000	
Dr. J. V. McGougan.																															
Goldsboro	W	1	2	2	5	2	0	6	4	2	1	5	1	31	75	3.4	6.9	6.9	17.1	6.9	0.0	20.6	13.7	6.9	3.1	16.2	3 5	8.4	13.9	3,700	5,400
T. H. Bain, Sec. B. of H.	C	3	2	1	2	3	2	11	8	3	5	1	3	44		24.0	16.0	8.0	13.3	20.0	13.3	73.3	53.3	24.0	35.3	7.1	21.2	25 9		1,700	
Greensboro	W	0	2	3	1	4	5	1	2	3	*a*	1	3	25	97	0.0	4.4	6.5	2 2	8.7	10.9	2.2	4.5	6.5	*a*	2.2	6.5	4.9	13.2	5,500	8,000
Dr. A. R. Wilson	C	5	5	5	9	7	9	5	7	6		8	6	72	11 mos.	10.9	24.0	24.0	43.2	33.6	43.2	24.0	33.6	28.8		38 4	28.8	31.4		2,500	
Henderson	W	1	0	0	1	1	2	1	4	0	0	1	2	13	50	5.3	0.0	0.0	5 3	5.3	10.7	5.3	21.3	0.0	0.0	5.3	10.7	5.8	11.8	2,250	4,250
Dr. W. J. Judd	C	3	2	3	1	5	3	4	2	4	3	4	3	37		18.0	12.0	18.0	6.0	30.0	18.0	18.0	12.0	24.0	18.0	24.0	18.0	18.5		2,000	
Hillsboro	W	3	2	0	0	0	0	0	0	0	0	0	0	5	12	90.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0 0	0.0	0.0	0.0	12.5	17.1	400	700
Dr. C. D. Jones	C	0	2	0	0	0	0	0	1	2	2	0	0	7		0.0	80.0	0.0	0.0	0.0	0.0	0.0	40.0	60.0	60.0	0.0	0.0	23.3		300	
Dr. D. C. Parris																															
Jacksonville	W	1	*a*	1	1	0	0	0	*a*	1	*a*	1	*a*	5	6	30.0	*a*	26.7	30.0	0.0	0.0	0.0	*a*	30.0	*a*	30.0	*a*	18.7	15 0	400	600
Dr. E. L. Cox	C	1		0	0	0	0	0		0		0		1	8 mos.	60.0		0.0	0.0	0.0	0.0	0.0		0.0		0.0		7.5		200	

TABLE No. III.—TABLE OF MORTALITY REPORTS FOR 1895, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.														DEATH RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
Lenoir	W	0	0	0	0	0	1	3	0	1	1	1	2	9	12	0.0	0.0	0.0	0.0	0.0	15.0	40.0	0.0	15.0	15.0	15.0	30.0	11.2	10.9	800	1,100
Dr. A. A. Kent	C	0	0	0	0	0	0	0	0	1	0	1	1	3		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	40.0	40.0	10.0		300	
Lexington	W	0	2	1	1	0	1	0	0	0	0	0	*a*	5	5	0.0	13.4	6.7	6.7	0.0	6.7	0.0	0.0	0.0	0.0	0.0	*a*	3.0	2.3	1,800	2,100
Dr. R. L. Payne	C	0	0	0	0	0	0	0	0	0	0	0		0	11 mos.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0		300	
Marion	W	3	0	0	1	0	0	1	2	1	1	1	*a*	10	12	55.4	0.0	0.0	18.5	0.0	0.0	18.5	36.9	17.1	17.1	17.1	*a*	15.6	13.1	700	1,000
Dr. B. A. Cheek	C	0	0	1	0	0	0	0	0	1	0	0		2	11 mos.	0.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0		7.3		300	
Dr. G. I. White																															
Monroe	W	1	1	2	0	0	0	3	1	1	1	1	0	11	24	6.7	6.7	13.3	0.0	0.0	0.0	20.0	6.7	6.7	6.7	6.7	0.0	6.1	10.0	1,800	2,400
Dr. J. M. Blair	C	1	1	2	1	0	1	1	2	1	1	1	1	13		20.0	20.0	40.0	20.0	0.0	20.0	20.0	40.0	20.0	20.0	20.0	20.0	21.7		600	
Oxford	W	0	1	1	1	2	1	2	3	0	0	1	2	14	42	0.0	8.0	8.0	8.0	16.0	7.5	15.0	22.5	0.0	0.0	7.5	15.0	8.7	14.0	1,600	3,000
Dr. W. O. Baskerville	C	1	1	1	3	5	1	4	3	1	5	3	0	28		9.2	9.2	9.2	27.7	46.2	8.6	34.3	25.7	8.6	42.8	25.7	0.0	20.0		1,400	
Pittsboro	W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350	600
Dr. L. A. Hanks	C	0	0	0	0	0	0	0	0	0	0	0	0	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		250	
Raleigh	W	14	11	13	6	8	17	12	20	17	13	10	10	151	314	21.0	16.5	19.5	8.4	11.3	24.0	16.9	28.2	24.0	18.3	14.1	14.1	17.8	19.6	8,500	16,000
Dr. James McKee	C	11	11	15	10	10	16	18	16	18	11	12	15	163		18.8	18.9	25.7	16.0	16.0	25.6	28.8	25.6	28.7	17.6	19.2	24.0	21.7		7,500	
Rockingham	W	0	2	2	1	0	*a*	3	0	1	5	3	2	19	23	0.0	18.5	18.5	9.2	0.0	*a*	27.7	0.0	9.2	46.1	27.7	18.5	15.9	14.3	1,300	1,750
Dr. J. M. Covington	C	0	1	0	0	0		1	0	0	0	1	1	4	11 mos.	0.0	26.7	0.0	0.0	0.0		26.7	0.0	0.0	0.0	26.7	26.7	9.7		450	
Dr. W. H. Steele																															
Rocky Mount	W	1	0	1	2	1	2	0	0	1	1	1	0	10	20	10.0	0.0	10.0	20.0	10.0	20.0	0.0	0.0	7.1	6.7	6.7	0.0	5.5	8.3	1,800	2,400
Dr. G. L. Wimberley	C	0	0	1	1	0	0	0	0	6	2	0	0	10		0.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0	90.0	40.0	0.0	0.0	16.7		600	
Salem	W	5	4	6	4	2	3	7	2	5	7	2	2	49	58	15.2	12.2	18.3	12.2	6.6	9.1	21.3	6.1	15.2	21.0	6.1	6.1	12.4	13.5	3,942	4,284
F. E. Keehln, H. O.	C	0	1	2	2	1	1	1	0	0	0	1	0	9		0.0	35.1	70.2	70.2	35.1	32.2	35.1	0.0	0.0	0.0	35.1	0.0	26.3		342	

TABLE No. III.—TABLE OF MORTALITY REPORTS FOR 1895, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.														DEATH-RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March	April.	May.	June	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
Salisbury	W	9	1	1	6	3	4	2	6	3	3	3	4	45	83	30.8	3.4	3.4	20.6	10.3	13.7	6.8	24.0	12.0	10.3	10.3	13.7	12.9	16.6	3,500	5,000
Dr. John Whitehead.	C	3	2	2	3	3	4	5	4	3	3	3	3	38		24.0	16.0	16.0	24.0	24.0	32.0	40.0	24.0	18.0	24.0	24.0	24.0	25.3		1,500	
Scotland Neck	W	0	1	0	1	1	1	1	2	2	0	0	0	9	18	0.0	17.1	0.0	17.1	17.1	17.1	15.6	30.9	31.4	0.0	0.0	0.0	11.6	15.0	775	1,200
Mayor J. A. Perry	C	0	1	0	2	0	1	1	1	2	1	0	0	9		0.0	30.0	0.0	60.0	0.0	30.0	29.4	28.2	56.5	28.2	0.0	0.0	21.2		425	
Southport	W	0	1	1	0	0	2	1	1	2	0	1	0	9	16 11 mos.	0.0	16.0	16.0	0.0	0.0	32.0	16.0	16.0	32.0	16.0	16.0	0.0	12.0	13.3	750	1,200
L. A. Galloway, C. C.	C	0	0	0	2	0	2	0	1	0	1	1	0	7		0.0	0.0	0.0	53.3	0.0	53.3	0.0	26.7	0.0	0.0	26.7	0.0	15.5		450	
Statesville	W	3	1	1	3	1	2	1	1	0	0	1	3	17	19	14.4	6.0	6.0	14.4	4.8	9.6	4.8	4.8	0.0	0.0	4.8	14.4	6.8	5.4	2,500	3,500
Dr. W. J. Hill	C	0	1	0	0	0	1	0	0	0	0	0	0	2		0.0	22.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0		1,000	
Tarboro	W	1	4	1	2	0	3	2	3	1	1	1	2	21	38	9.5	38.1	9.5	19.1	0.0	2.8	18.5	27.7	9.2	9.2	9.2	18.5	16.1	15.2	1,300	2,500
Dr. Donald Williams	C	0	2	2	1	2	0	1	3	2	2	0	2	17		0.0	11.2	21.6	10.8	21.6	0.0	10.0	30.0	0.0	20.0	0.0	20.0	14.2		1,200	
Warrenton. Dr. P. J. Macon	W	0	1	0	1	1	0	0	*a*	*a*	*a*	0	0	3	8 9 mos.	0.0	14.1	0.0	14.1	14.1	0.0	0.0	*a*	*a*	*a*	0.0	0.0	4.0	6.7	1,000	1,600
Dr. G. A. Foote	C	0	0	2	2	1	0	0				0	0	5		0.0	0.0	36.9	36.9	18.5	0.0	0.0				0.0	0.0	11.1		600	
Washington Dr. J. C. Rodman	W	3	1	2	3	7	6	3	3	6	*a*	5	4	43	99 11 mos.	12.0	4.0	8.0	12.0	28.0	24.0	12.0	12.0	24.0	*a*	20.0	16.0	15.6	19.6	3,000	5,500
Dr. Joshua Tayloe	C	1	9	1	4	6	7	8	0	10		6	4	56		4.8	43.2	4.8	19.2	28.9	33.6	38.4	0.0	48.0		28.8	19.2	24.4		2,500	

TABLE No. III.—TABLE OF MORTALITY REPORTS FOR 1895, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.														DEATH-RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
Weldon	W	0	0	0	0	0	0	1	*a*	0	1	0	0	2	22	0.0	0 0	0.0	0.0	0.0	0.0	17 1	*a*	0.0	17.1	0.0	0.0	3.1	16.5	700	1,450
Mayor J. T. Gooch	C	2	0	3	0	3	0	4		2	5	0	1	20	11 mos.	30.0	0.0	46.4	0.0	48.0	0.0	64.0		32.0	80.0	0.0	16.0	29.1		750	
Wilmington	W	17	8	17	10	13	16	17	10	19	14	8	9	141	412	22.7	10.7	22.7	13.3	17.3	21.3	22.7	13.3	25 3	18.7	10.7	12.0	17.5	20.5	9,000	22,000
Dr. R. D. Jewett	C	20	23	22	12	24	32	31	16	31	36	19	27	271		18.5	21.2	20 3	11 1	22.2	29.5	28.6	14.8	28.6	33.2	17.5	24.9	22.5		13,000	
Dr. J. C. Shepard																															
Wilson	W	2	1	2	1	2	3	1	1	1	7	2	2	25	71	12.0	6.0	12.0	6.0	12.0	18.0	6.0	6.0	6.0	42.0	12.0	9.6	12.5	20.3	2,000	3,500
Dr. Albert Anderson	C	1	1	5	3	3	5	7	3	6	6	1	5	46		8.0	8.0	40 0	24 0	24.0	40.0	56.0	24.0	40.0	48.0	8.0	40 0	30.7		1,500	
Winston	W	3	7	4	4	7	4	5	8	3	4	7	3	59	213	6 9	16.2	9 2	9.2	16.1	9 2	11.5	18.5	6.9	9.2	16.1	6.9	11 3	21.3	5,200	10,000
Dr. John Bynum	C	11	13	9	11	10	16	11	10	18	18	13	14	154		27.5	32.5	22 5	27.5	25.0	40.0	27.5	25.0	45.0	42.9	32.5	35.0	32.1		4,800	

TABLE No. IV.—TABLE OF MORTALITY REPORTS FROM TOWNS FOR YEAR ENDING DECEMBER 31, 1896.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.														DEATH RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
CHARLOTTE	W	38	24	15	11	17	16	10	17	17	15	9	4	193	360	42.0	26.5	16.6	12.2	18.8	17.7	11 0	18.8	18.8	16.6	9.9	4.4	17.8	18.3	10,855	19,651
C. A. Spratt, H. O.	C	18	12	18	14	16	16	16	13	10	14	12	8	167		23.4	16.4	23.4	19.1	21.8	21.8	21 8	17.7	13.6	19.1	16.4	10.9	19.0		8,796	
FAYETTEVILLE	W	2	7	4	2	2	7	1	5	4	5	5	5	49	102	6.8	24.0	13.7	6 8	6 9	24.0	3.4	17.1	13.7	17.1	17.1	17.1	14.0	17.0	3,500	6,000
Dr. J. V. McGougan.	C	4	3	5	5	3	7	6	8	0	5	4	3	53		19.2	14.4	24.0	24.0	14.4	33.6	28.8	38.4	0.0	24.0	19.2	14.4	21.2		2,500	
GOLDSBORO	W	1	3	4	3	3	4	5	0	3	3	4	4	37	80	3.2	9.7	13.0	9.7	9.7	13.0	16.2	0 0	9.7	9.7	13.0	13.0	10.0	14.8	3,700	5,400
T. H. Bain, Clerk	C	2	5	4	2	5	4	5	5	2	4	2	3	43		14.1	35.3	28.2	14.1	35.3	28.2	35.3	35.3	14.1	28.3	14.1	21.2	25.3		1,700	
GREENSBORO	W	0	7	6	6	6	5	4	6	0	4	3	1	48	146	0.0	15.3	13.1	13.1	13.1	10.9	8.7	13.1	0.0	8.7	6.5	2.2	8.7	18.2	5,500	8,000
J. S. Michaux, Clerk	C	4	9	14	8	8	12	8	10	5	8	4	8	98		19.2	43.2	67.2	38 4	38.4	57.6	38.1	48.0	24.0	38.4	19.2	38.4	39.2		2,500	
HENDERSON	W	1	1	1	1	3	1	5	2	1	1	1	2	20	68	5.3	5.3	5.3	5.3	16.0	5.3	26.7	10.7	5.3	5.3	5.3	10.7	8.9	16.0	2,250	4.250
Dr. W. J. Judd	C	4	4	4	3	0	5	10	4	2	6	2	4	48		24.0	24.0	24.0	18.0	0.0	30 0	60.0	24.0	12.0	36.0	12.0	24.0	24.0		2 000	
HILLSBORO	W	1	0	0	0	1	2	1	1	0	0	0	0	6	15	30.0	0.0	0.0	0.0	30.0	60.0	30.0	30.0	0.0	0.0	0.0	0.0	15.0	21 4	400	700
Dr. D. C. Parris	C	0	1	0	2	1	1	1	1	1	1	0	0	9		0.0	40.0	0.0	80.8	40.0	40.0	40.0	40.0	40.0	10.0	0.0	0.0	30.0		300	
JACKSONVILLE	W	0	0	1	0	0	1	0	3	0	0	0	0	5	7	0.0	0.0	60.0	0.0	0.0	60.0	0.0	180 0	0.0	0.0	0.0	0.0	25.0	23.3	200	300
Dr. E. L. Cox	C	0	0	0	0	0	0	1	1	0	0	0	0	2		0 0	0.0	0.0	0.0	0.0	0 0	120.0	120.0	0.0	0.0	0.0	0.0	20.0		100	
LENOIR	W	0	1	1	0	3	1	2	0	0	2	0	1	11	15	0.0	15.0	15.0	0.0	43.7	15.0	30.0	0.0	0.0	0.0	0.0	15.0	13.7	13.6	800	1,100
Dr. A. A. Kent	C	0	1	0	0	0	1	0	0	0	1	0	1	4		0.0	40.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	40.0	0.0	40.0	13.3		300	
MONROE	W	3	0	0	2	0	2	5	2	1	0	0	0	15	27	20.0	0.0	0.0	13.3	0.0	13.3	33.3	13.3	6.7	0.0	0.0	0.0	8.3	11.2	1,800	2,400
Dr. J. M. Blair	C	0	3	1	0	1	1	0	0	2	1	1	2	12		0.0	60.0	20.0	0.0	20.0	20.0	0.0	0.0	40.0	20.0	20.0	40.0	20.0		600	
OXFORD Dr. W. O. Baskerville	W	2	1	0	0	2	4	2	4	1	1	1	1	19	43	16.0	8.0	0.0	0.0	16.0	32.0	16.0	32.0	8.0	8.0	8.0	8.0	12.7	17.2	1,500	2,500
Dr. T. L. Booth	C	1	2	1	0	3	4	6	1	0	3	2	1	24		12.0	24.0	12.0	0.0	36.0	40.0	72.0	12.0	0.0	36.0	24.0	12.0	24.0		1,000	

TABLE No. IV.—TABLE OF MORTALITY REPORTS, FOR 1896, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.														EATH RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR.		POPULATION.	
		January.	February.	March	April	May.	June.	July.	August.	September	October.	November.	December.	Total by Races.	Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
RALEIGH	W	10	11	17	10	14	6	12	8	11	7	3	11	120	297	16.8	18.3	28.5	16.8	23.3	10.0	20.0	13.3	18.3	11.7	5.0	18.3	16.7	22.5	7,200	13,200
T. P. Sale, Clk. Bd. H.	C	11	9	9	18	24	17	28	13	8	17	14	9	177		22.6	18.0	18.0	36.0	48.0	34.0	56.0	26.0	16.0	34.0	24.0	18.0	29.5		6,000	
ROCKINGHAM	W	3	4	2	5	2	1	7	5	1	1	0	0	31	40	27.7	36.9	18.4	46.1	18.5	9.2	64.6	46.1	9.2	9.2	0.0	0.0	23.8	22.9	1,300	1,750
Dr. W. H. Steele	C	1	1	1	1	2	1	1	0	0	1	0	0	9		26.7	26.7	26.7	26.7	53.3	26.7	26.7	0.0	0.0	26.7	0.0	0.0	20.0		450	
ROCKY MOUNT	W	1	1	0	1	4	0	2	1	0	0	1	1	12	16	7.5	7.5	0.0	7.5	30.0	0.0	15.0	7.5	0.0	0.0	7.5	7.5	7.5	6.7	1,600	2,400
Dr. G. L. Wimberley	C	0	0	0	1	0	0	1	0	1	0	0	1	4		0.0	0.0	0.0	15.0	0.0	0.0	15.0	0.0	15.0	0.0	0.0	15.0	5.0		800	
SALEM	W	4	2	8	4	5	5	4	5	2	2	2	5	48	69	12.2	6.1	24.3	12.2	15.2	15.2	12.0	15.2	6.1	6.1	6.1	15.2	12.2	16.1	3,942	4,284
C. S. Hauser, H. O. S. C. Butner, H. O.	C	1	5	1	0	2	2	2	1	1	3	0	3	21		35.0	175.4	35.0	0.0	70.2	70.2	70.2	35.4	35.1	105.3	0.0	105.3	61.4		342	
SALISBURY	W	3	6	13	5	6	5	7	3	5	3	0	7	63	133	12.9	20.6	44.6	17.2	20.6	17.1	24.0	10.3	17.1	10.3	0.0	24.0	17.5	26.6	3,500	5,000
Dr. John Whitehead	C	4	4	14	9	8	10	5	4	1	5	5	1	70		32.0	32.0	112.0	72.0	64.0	80.0	40.0	32.0	8.0	40.0	40.0	8.0	46.7		1,500	
SCOTLAND NECK	W	1	1	0	0	1	2	0	3	1	1	0	1	11	20	15.5	15.5	0.0	0.0	15.5	30.9	0.0	46.4	15.5	15.5	0.0	15.6	14.2	16.7	775	1,200
J. A. Perry, Mayor	C	0	0	1	1	2	2	0	2	0	1	0	0	9		0.0	0.0	28.2	28.2	56.4	56.4	0.0	56.4	0.0	28.2	0.0	0.0	21.2		425	
SOUTHPORT	W	1	1	2	0	1	1	0	1	0	2	1	0	10	19	16.0	16.0	32.0	0.0	15.0	15.0	0.0	15.0	0.0	30.0	15.0	0.0	12.5	15.8	800	1,200
L. A. Galloway, Cl'ks E. B. Stevens,	C	0	1	2	0	1	0	1	1	1	1	0	1	9		0.0	26.7	53.3	0.0	30.0	60.0	30.0	24.0	30.0	30.0	0.0	30.0	22.7		400	
TARBORO	W	1	1	0	3	0	2	2	1	2	0	4	3	19	27	9.2	9.2	0.0	27.7	0.0	18.5	18.5	9.2	18.5	0.0	36.9	27.7	14.6	10.8	1,300	2,500
Dr. Donald Williams Dr. L. L. Staton	C	0	1	1	0	1	1	0	2	0	0	0	2	8		0.0	10.0	10.0	0.0	10.0	10.0	0.0	20.0	0.0	0.0	0.0	20.0	6.7		1,200	
WARRENTON	W	0	0	0	1	2	2	0	1	0	0	0	1	7	12	0.0	0.0	0.0	12.0	24.0	24.0	0.0	12.0	0.0	0.0	0.0	12.0	7.0	8.0	1,000	1,500
Dr. Geo. A. Foote	C	1	1	1	1	0	0	0	0	0	1	0	0	5		24.0	24.0	24.0	24.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0	10.0		500	

TABLE No. IV.—TABLE OF MORTALITY REPORTS, FOR 1896, ETC.—CONTINUED.

TOWNS AND REPORTERS.	Races.	DEATHS BY MONTHS.													Grand Total.	DEATH RATE (ANNUAL) PER 1,000, BY MONTHS.												RATE FOR YEAR		POPULATION.	
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total by Races.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	Total.
WASHINGTON.........	W	5	3	4	2	5	3	3	4	5	5	2	3	44	114	20.0	12.0	16 0	8.0	20.0	12.0	12.0	16.0	20.0	20.0	8.0	12.0	14.7	20.7	3,000	5.500
Dr. Joshua Tayloe ...	C	3	6	4	9	4	6	8	8	8	6	0	8	70		14.4	28.8	19.2	43.2	19.2	28.8	38 4	38.4	38.4	28.8	0.0	38.4	28.0		2,500	
WELDON.	W	2	2	0	1	0	0	2	1	0	1	3	1	13	34	34.3	34.3	0 0	17.1	0.0	0.0	34.3	17.1	0.0	17.1	51.4	17.1	18.6	23.4	700	1,450
J. T. Gooch, Mayor..	C	0	3	1	2	1	1	1	3	2	2	3	2	21		0.0	48.0	16.0	32.0	16.0	16.0	16.0	48.0	32.0	32.0	48.0	32.0	28.0		750	
WILMINGTON	W	17	19	12	12	19	11	9	17	14	12	8	11	161	469	22.7	25.3	11.1	16.0	25.3	14.7	12.0	22.7	18.7	16.0	10.7	14.7	17.8	21.3	9,000	22,000
Dr. J. C. Shepard......	C	26	15	21	22	29	30	27	43	32	28	15	20	308		24.0	13.8	28.0	20.3	26.8	27.7	24.9	35.1	29.5	25.8	13.8	17.7	23.7		13,000	
WILSON	W	4	2	1	6	2	2	6	6	1	2	3	0	35	60	19 2	9.6	4.8	28.8	9.6	9.6	28.8	28.8	4.8	9 6	14.4	0.0	14.0	13.3	2,500	4.500
Dr. N. Anderson	C	3	2	2	3	2	2	1	2	3	2	2	1	25		18.0	12.0	12.0	18.0	12.0	12.0	6.0	12.0	18.0	12.0	12.0	6.0	12.0		2,000	
WINSTON	W	5	4	3	4	5	12	7	4	5	13	4	5	71	252	11.5	9.2	6.9	9.2	11.5	27.7	16.1	9.2	11.5	30.0	9.2	15.5	13.6	25.2	5,200	10,000
Dr. John Bynum	C	15	24	15	15	19	12	13	16	17	17	9	9	181		37.5	60.0	37.5	37.5	47 5	30.0	32.5	40.0	42.5	42.5	22.5	22.5	37.7		4,800	

N. B.—In order to assure as far as possible the accuracy of the mortuary statistics of the cities and towns the reporters were required during the year 1896 to sign this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." In the above table no city or town is included to each monthly report of which the said certificate was not appended.

TABLE No. V.—SHOWING CAUSES OF DEATH FOR YEAR ENDING DECEMBER 31, 1895.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.	REMARKS.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Asheville	White	8,000	12,000	13.9	12.2	5	0	0	0	0	1	15	*40	7	5	3	8	25	1	1	0	111	147	13	9	
	Colored	4,000		9.0		0	0	0	0	0	0	3	7	0	2	2	3	16	0	1	2	36		10	6	
Charlotte	White	10,855	19,651	14.2	16.5	15	0	3	0	3	1	4	13	15	12	0	41	41	4	2	0	154	325	58	3	
	Colored	8,796		19.4		10	0	5	1	1	7	15	30	2	20	5	19	51	5	0	0	171		54	12	
Durham	White	4,000	6,000	9.7	7.7	4	0	0	0	0	0	4	6	3	4	2	9	6	0	1	0	39	46	12	4	
	Colored	2,000		3.5		0	0	0	0	0	0	2	0	1	1	0	1	2	0	0	0	7		2	0	
Fayetteville	White	3,000	5,000	14.3	17.6	4	0	1	1	0	0	0	5	6	5	0	6	13	2	0	0	43	88	7	6	
	Colored	2,000		22.5		0	1	3	0	0	0	5	5	3	4	0	6	16	2	0	0	45		8	6	
Goldsboro	White	3,700	5,400	8.4	13.9	2	1	0	0	0	0	2	5	0	4	0	6	10	1	0	0	31	75	8	8	
	Colored	1,700		25.9		0	0	2	0	2	1	2	8	1	7	0	5	16	0	0	0	44		8	1	
Henderson	White	2,250	4,250	5.8	11.8	2	0	0	0	1	0	0	1	3	1	0	0	[illegible]	1	0	0	13	50	2	0	
	Colored	2,000		18.5		2	0	1	0	3	0	1	8	1	2	1	6	12	0	0	0	37		12	0	
Hillsboro	White	400	700	12.5	17.1	0	0	0	0	0	0	2	0	2	0	0	0	1	0	0	0	5	12	0	2	
	Colored	300		23.3		0	0	0	0	0	0	0	0	0	1	0	2	4	0	0	0	7		0	1	
Lenoir	White	800	1,100	11.2	10.9	1	0	0	0	0	0	0	0	0	1	1	0	5	1	0	0	9	12	3	0	
	Colored	300		10.0		0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	3		2	0	
Lexington	White	1,800	2,100	3.0	2.3	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	1	5	5	0	0	
	Colored	300		0.0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
Marion	White	700	1,000	15.6	13.1	3	0	0	0	0	0	0	1	2	1	1	0	2	0	0	0	10	12	0	1	
	Colored	300		7.3		1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2		0	1	

TABLE No. V.—Showing Causes of Death for 1895, Etc.—Continued.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.	REMARKS.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Monroe	White	1,800	2,400	6.1	10.0	0	0	0	0	0	0	3	0	1	2	0	3	2	0	0	0	11	24	0	0	
	Colored	600		21.7		1	0	2	0	0	0	0	2	0	0	0	2	5	1	0	0	13		0	0	
Oxford	White	1,600	3,000	8.7	14.0	0	0	0	0	0	0	3	1	3	1	0	1	5	0	0	0	14	42	2	3	
	Colored	1,400		20.0		0	0	0	1	0	0	2	5	1	1	0	4	13	1	0	0	28		5	5	
Pittsboro	White	350	600	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Colored	250		0.0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	
Raleigh	White	8,500	16,000	17.8	19.6	10	1	4	2	0	0	17	14	16	22	3	14	47	0	0	1	151	314	42	13	
	Colored	7,500		21.7		3	0	4	0	1	0	7	24	8	10	4	18	76	8	0	0	163		73	23	
Rocky Mount	White	1,800	2,400	5.5	8.3	0	0	0	1	0	0	3	0	2	0	0	1	2	0	1	0	10	20	0	0	
	Colored	600		16.7		2	0	1	0	0	0	0	1	2	0	0	0	3	0	0	1	10		0	0	
Salem	White	3,942	4,284	12.4	13.5	1	0	0	0	0	0	2	5	8	6	0	5	22	0	0	0	49	58	20	1	
	Colored	342		26.3		0	0	0	0	0	0	3	1	0	0	0	1	4	0	0	0	9		2	2	
Salisbury	White	3,500	5,000	12.9	16.6	0	0	0	0	0	0	6	4	5	5	0	9	16	0	0	0	45	83	8	1	
	Colored	1,500		25.3		2	0	0	0	0	0	4	9	0	1	0	10	12	0	0	0	38		8	2	
Scotland Neck	White	775	1,200	11.6	15.0	1	0	0	0	0	0	0	1	1	2	0	1	2	1	0	0	9	18	3	2	
	Colored	425		21.2		1	0	0	0	0	0	0	1	0	0	0	3	4	0	0	0	9		5	0	
Southport	White	750	1,200	12.0	13.3	0	0	0	0	0	0	0	2	0	2	0	1	3	1	0	0	9	16	1	1	
	Colored	450		15.5		0	0	1	0	0	0	0	1	0	0	0	1	2	2	0	0	7		1	0	
Statesville	White	2,500	3,500	6.8	5.4	0	4	0	0	0	0	1	0	0	0	0	2	10	0	0	0	17	19	2	1	
	Colored	1,000		2.0		0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2		1	1	

TABLE No. V.—SHOWING CAUSES OF DEATH FOR 1895, ETC.—CONTINUED.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhoeal Diseases	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still born.	REMARKS.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Tarboro	White	1,300	2,500	16.1	15.2	3	0	1	0	0	0	3	3	1	1	0	0	9	0	0	0	21	38	5	0	
	Colored	1,200		14.2		1	0	1	0	0	0	1	1	1	4	0	3	4	1	0	0	17		4	0	
Wilmington	White	9,000	22,000	17.5	20.5	7	2	7	0	0	0	11	19	17	12	0	15	64	4	0	0	158	451	41	6	
	Colored	13,000		22.5		4	0	24	0	0	0	12	53	8	25	4	28	133	2	0	0	293		104	41	
Wilson	White	2,000	3,500	12.5	20.3	2	0	4	0	0	0	2	3	2	2	0	3	7	0	0	0	25	71	5	4	
	Colored	1,500		30.7		0	0	3	0	0	0	0	0	0	0	0	5	37	1	0	0	46		20	3	
Winston	White	5,200	10,000	11.3	21.3	2	0	1	0	0	0	2	13	6	2	2	8	20	2	1	0	59	213	12	3	
	Colored	4,800		32.1		4	0	2	0	0	0	11	49	5	15	1	25	41	1	0	0	154		54	14	
Total, 24 Towns	White	78,522	134,685	12.8	15.8	62	8	21	4	4	2	81	137	100	90	12	133	318	18	6	2	998	2139	224	68	
	Colored	56,163		20.3		31	1	49	2	7	8	68	207	33	94	17	142	453	25	1	3	1144		373	118	
Grand Total		134,685				93	9	70	6	11	10	149	344	133	184	29	275	771	43	7	5	2139		597	186	
Greensboro	White	5,500	8,000	4.9	13.2	2	0	0	0	0	0	2	4	2	1	4	0	7	3	0	0	25	97	3	4	11 months, Dec. omitted.
	Colored	2,500		31.4		3	0	1	0	0	0	9	12	6	5	2	3	32	5	0	0	72		18	1	
Jacksonville	White	400	600	18.7	15.0	0	0	1	0	0	1	1	0	0	0	0	1	1	0	0	0	5	6	0	0	8 months, Feb., Aug., Oct. & Dec. omitted.
	Colored	200		7.5		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1		0	0	
Rockingham	White	1,300	1,750	15.9	14.3	0	0	0	0	0	0	4	1	2	2	0	1	9	0	0	0	19	23	4	0	11 months, June omitted.
	Colored	450		9.7		0	0	0	0	0	0	1	2	0	0	0	0	1	0	0	0	4		0	0	

*Nearly all the deaths from consumption were of visitors.

TABLE No. V.—Showing Causes of Death for 1895, Etc.—Continued.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.	REMARKS.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.			
Warrenton	White...	1,000	1,600	4.0	6.7	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	3	8	0	0	9 months, Aug., Sept. & Oct. omitted.
	Colored	600		11.1		0	0	0	0	0	0	0	1	0	1	0	0	3	0	0	0	5		0	0	
Washington.........	White...	3,000	5,500	15.6	19.6	2	0	1	0	0	0	0	2	10	5	0	8	13	2	0	0	43	99	15	0	11 months, Oct. omitted.
	Colored	2,500		24.4		3	0	5	0	1	0	2	5	5	0	0	6	25	4	0	0	56		23	2	
Weldon	White...	700	1,450	3.1	16.5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	22	0	0	11 months, Aug. omitted.
	Colored	750		29.1		0	0	1	0	0	0	1	3	0	1	0	4	8	2	0	0	20		5	0	

TBALE No. VI.—Showing Causes of Death for Year Ending December 31, 1896.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
CHARLOTTE	White...	10,855	19,651	17.8	18.3	14	0	0	1	2	20	24	15	15	10	7	31	47	2	2	0	193	360	81	15
	Colored	8,796		19.0		13	0	2	0	2	7	19	21	12	19	6	21	41	4	0	0	167		71	19
FAYETTEVILLE	White...	3,500	6,000	14.0	17.0	3	1	7	0	2	1	3	3	1	6	2	4	13	0	0	0	49	102	14	4
	Colored	2,500		21.2		1	0	11	0	1	0	3	7	1	5	3	4	14	0	0	0	53		22	5
GOLDSBORO	White...	3,700	5,400	10.0	14.8	0	0	5	0	0	0	0	3	1	3	0	8	17	0	0	0	37	80	12	4
	Colored	1,700		25.3		2	0	2	0	0	0	3	6	0	2	0	3	23	2	0	0	43		19	3
GREENSBORO	White...	5,500	8,000	8.7	18.2	3	0	0	0	0	3	5	4	5	2	0	3	23	0	0	0	48	146	19	2
	Colored	2,500		39.2		6	0	1	0	0	5	11	14	9	12	0	1	39	0	0	0	98		38	9
HENDERSON	White...	2,250	4,250	8.9	16.0	2	0	0	0	1	0	1	2	2	1	1	4	6	0	0	0	20	68	7	1
	Colored	2,000		24.0		5	0	1	0	4	0	5	8	1	0	0	11	12	1	0	0	48		21	3
HILLSBORO	White..	400	700	15.0	21.4	0	0	2	0	0	0	0	1	1	1	0	1	0	0	0	0	6	15	1	0
	Colored	300		30.0		0	0	0	0	0	0	1	3	1	2	0	1	1	0	0	0	9		1	1
JACKSONVILLE	White..	200	300	25.0	23.3	0	0	2	0	0	0	1	0	2	0	0	0	0	0	0	0	5	7	0	0
	Colored	100		20.0		0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2		0	0
LENOIR	White...	800	1,100	13.7	13.6	2	0	0	0	0	1	0	0	2	2	1	1	2	0	0	0	11	15	2	0
	Colored	300		13.3		0	0	0	0	1	0	0	0	2	0	0	0	1	0	0	0	4		1	0
MONROE	White...	1,800	2,400	8.3	11.2	3	0	1	0	0	2	0	1	0	2	0	2	4	0	0	0	15	27	1	0
	Colored	600		20.0		0	0	2	0	0	3	0	3	0	0	0	1	3	0	0	0	12		0	0
OXFORD	White...	1,500	2,500	12.7	17.2	4	0	1	0	0	0	0	0	2	0	0	3	8	1	0	0	19	43	8	2
	Colored	1,000		24.0		1	0	0	0	0	0	0	4	1	0	0	6	10	1	0	1	24		11	0

TABLE No. VI.—Showing Causes of Death for 1896, Etc.—Continued.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
RALEIGH	White... Colored	7,200 6,000	13,200	16.7 29.5	22.5	0 8	0 0	1 2	1 1	0 1	4 3	12 20	12 32	18 11	5 7	4 6	17 14	44 69	1 2	1 0	0 1	120 177	297	32 58	4 18
ROCKINGHAM	White... Colored	1,300 450	1,750	23.8 20.0	22.9	7 0	0 0	0 0	0 0	0 0	0 0	5 1	1 0	0 0	3 4	1 0	3 0	11 4	0 0	0 0	0 0	31 9	40	5 2	0 0
ROCKY MOUNT	White... Colored	1,600 800	2,400	7.5 5.0	6.7	3 1	0 0	0 1	0 0	0 0	0 0	1 0	0 1	1 1	0 0	0 0	4 0	3 0	0 0	0 0	0 0	12 4	16	1 0	0 0
SALEM	White... Colored	3,942 342	4,284	12.2 61.4	16.1	2 2	0 0	0 0	1 1	0 0	1 0	4 7	2 2	2 1	6 1	0 0	2 3	27 4	1 0	0 0	0 0	48 21	69	10 6	4 0
SALISBURY	White... Colored	3,500 1,500	5,000	17.5 46.7	26.6	6 2	0 0	0 1	0 0	5 8	2 14	10 4	7 14	5 3	5 4	0 0	5 6	18 14	0 0	0 0	0 0	63 70	133	13 26	0 0
SCOTLAND NECK	White... Colored	775 425	1,200	14.2 21.2	16.7	0 0	0 0	1 1	0 0	0 0	0 0	0 0	0 1	1 0	2 2	0 0	2 1	4 3	0 1	0 0	1 0	11 9	20	4 2	0 1
SOUTHPORT	White... Colored	800 400	1,200	12.5 22.7	15.8	0 0	0 0	0 0	0 0	0 0	0 0	2 0	1 1	2 0	0 0	0 0	0 1	5 6	0 1	0 0	0 0	10 9	19	3 1	1 2
TARBORO	White... Colored	1,300 1,200	2,500	14.6 6.7	10.8	1 0	0 0	0 0	0 0	0 0	0 1	0 0	2 1	0 2	2 0	2 1	2 1	9 2	1 0	0 0	0 0	19 8	27	3 0	1 1
WARRENTON	White... Colored	1,000 500	1,500	7.0 10.0	8.0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1 2	1 0	0 0	1 0	2 0	2 3	0 0	0 0	0 0	7 5	12	0 0	1 1
WASHINGTON	White... Colored	3,000 2,500	5,500	14.7 28.0	20.7	2 5	0 0	0 8	0 0	0 0	0 0	3 4	7 2	3 3	4 4	1 2	6 10	15 30	2 2	1 0	0 0	44 70	114	8 16	0 0

TABLE No. VI.—Showing Causes of Death for 1896, Etc.—Continued.

TOWNS.	RACES.	POPULATION.		Annual Death Rate per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrhœal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still Born.
		By Races.	Total.	By Races.	Total.																	By Races.	By Towns.		
WELDON	White...	700	1,450	18.6	23.4	0	1	2	1	0	0	0	1	0	0	0	0	7	0	0	1	13	34	4	1
	Colored	750		28.0		1	0	2	0	0	0	2	1	0	0	0	0	15	0	0	0	21		9	1
WILMINGTON......	White..	9,000	22,000	17.8	21.3	7	0	10	0	0	4	10	24	14	9	1	24	53	5	0	0	161	469	52	22
	Colored	13,000		23.7		11	0	40	0	0	8	17	43	7	16	1	35	118	12	0	0	308		117	46
WILSON	White...	2,500	4,500	14.0	13.3	1	0	2	0	3	0	3	5	0	0	2	1	17	1	0	0	35	60	15	5
	Colored	2,000		12.0		0	0	1	0	0	0	2	7	0	1	1	2	11	0	0	0	25		8	4
WINSTON............	White...	5,200	10,000	13.6	25.2	10	0	0	7	0	0	6	12	3	6	0	7	19	1	0	0	71	252	26	8
	Colored	4,800		37.7		6	0	0	0	0	12	20	47	8	8	1	30	46	3	0	0	181		58	21
Total 24 Towns...	White...	72,322	126,785	14.5	19.1	70	2	34	14	13	38	90	104	84	69	23	132	354	15	4	2	1,048	2,425	321	75
	Colored	54,463		25.3		64	0	77	2	17	53	119	220	66	87	21	151	469	29	0	2	1,377		487	134
Grand Total	....	126,785	....	....	....	134	2	111	16	30	91	209	324	150	156	44	283	823	44	4	4	2,425	....	808	209

N. B.—In order to assure as far as possible the accuracy of the mortuary statistics of the cities and towns the reporters were required during the year 1896 to sign this certificate: "I hereby certify that this report gives the *whole* number of deaths occurring within the corporate limits during the above month." In the above table no city or town is included to each monthly report of which the said certificate was not appended.

THE MONTHLY BULLETIN.

This publication of the Board, the editing and preparation of which is one of the duties of the Secretary, has appeared with regularity during the past two years. Besides recording the monthly reports of the county superintendents of health, the mortuary reports from cities and towns, the condition of the jails and county homes, etc., it is utilized as a medium of instruction in matters relating to hygiene and for the purpose of encouraging interest in the subject. As showing the kind of work done on this line, some extracts from the issues of the last biennial period are appended.

PUBLIC SENTIMENT AND OUR HEALTH AND MEDICAL LAWS.

Those who have had most at heart the preservation in their integrity of the excellent laws now upon the statute books of our State bearing upon the subjects of sanitation and the practice of medicine have always felt more or less trepidation upon the assembling of each Legislature lest they should be abolished or fatally amended. This feeling of anxiety has arisen from the fact that the laws being of a more or less technical character, and therefore hard to explain to laymen, especially by any one not thoroughly familiar with their *raison d'etre* and their practical working, any general discussion of them would be liable to result in injudicious and hurtful changes. But the main trouble has been the indifference of the legislators on these subjects because of the want of interest in them manifested by their constituents. Such being the general attitude of this body, it is easy to understand how little resistance might be made to a bill urged by a member of more or less influence and popularity. Almost invariably the motive for the introduction of the amendment or the special act practically setting aside the law, in part, at least, is to accommodate some individual constituent of the member, and this, too, with an utter disregard of the effect upon the State at large. It is the work of the mere politician as contradistinguished from the statesman, but has not met the sympathy or support of the majority. We do not wish to be understood as complaining of our Legislatures. On the contrary, we have every reason to be grateful when we call to mind the fact that we have the best medical license law in the country, and have had it longer than any other State, and health laws in advance of public sentiment. Our object has been to set forth the reasons for the feeling of anxiety referred to in the beginning.

When the political revolution of last fall occurred, and a new element came into power, our fears were naturally increased. But they proved to be entirely groundless. It was soon developed that our laws had many and powerful friends in each of the three parties represented. Among these many friends we feel that it would not be making any invidious comparison to particularly mention our County Superintendent of Tyrrell, Dr. Ab. Alexander, who was the representative from that county, and who, as chairman of the Committee on Public Health of the House, proved indeed a faithful sentinel upon the watch-tower. Quite a number of bills inimical to our medical and health laws were introduced, but if we were not misinformed only one—a special act authorizing two men to register who had failed on their examination for license—passed, and that so amended as to permit their registration as soon as they obtained license—a privilege they possessed before the Legislature met.

The occurrences which were specially gratifying and reassuring as showing the state of public sentiment in favor of our laws, were these:

A bill was introduced requiring our Board of Medical Examiners to issue license to any one presenting a license from any other State. To those not familiar with the fact that the States with whom we would be willing to reciprocate in this matter could be counted on the fingers of one hand and leave digits unused, this was a very fair sounding bill. It was withdrawn from the Committee on Public Health and referred to the Judiciary Committee, which was composed of not lawyers only, but farmers and men following other vocations. When it came up, we were told by a member of the committee, it was reported adversely, and that, too, by a very large majority. And he added that the Populist members were more outspoken in their opposition to any change whatever in our medical license law than any others. The significance of this lies in the fact that those belonging to the People's party were in large part farmers themselves, and represented the most conservative element in every population, the element that is always most difficult to induce to take hold of any new thing.

Again, a bill to repeal the act relating to the Board of Health was introduced by the most prominent farmer in either House, himself a member of the majority, and the same committee promptly recommended that "this bill do *not* pass." Now while the leading men in the Legislature had had their attention called to the inadvisability of having our medical and health laws amended in any particular, and the desire had been expressed that any attempts in that direction should, if possible, be defeated in the committee in order to avoid a general discussion for the reasons set forth above, no outside friend of our laws appeared before the Judiciary Committee in either of the two instances just mentioned. In other words, the committee did not need any urging or persuading to continue to the people the protection afforded under our present statutes; they did it of their own motion.

Another instance, still more reassuring, as showing the temper of the whole House of Representatives, was this: A bill to regulate the practice of medicine in Stokes and Surry counties, introduced doubtless in the interest of a number of illegal practitioners in that locality, was reported to the House favorably by the Committees on Propositions and Grievances, but notwithstanding the favorable report it was promptly tabled. A similar bill applying to the whole State was also laid upon the table in the Senate.

The statement of facts made above warrants, in our opinion, the belief that we at last have the people with us—that they realize and appreciate the value and importance of the laws enacted for the purpose of protecting their health and lives. If our confidence is not misplaced we can venture, when the Legislature meets again two years hence, to ask for still further improvements in our legal machinery.

PREVENTION OF TUBERCULOSIS.

In our remarks on "Malaria and Drinking Water Again" in our last issue we stated that a paper on that subject in the Appendix to the Biennial Report would be reprinted in pamphlet form for general distribution. Another paper, which also appears in the Appendix, on the Prevention of Tuberculosis, by Dr. S. Westray Battle, of Asheville, has also been reprinted in an edition of 10,000 for the same purpose. To those who enjoy the privilege of knowing Dr. Battle it is unnecessary to say that it is both valuable and interesting. We desire its widest possible circulation and would be glad to have the names of all those who desire a copy, and particularly of those who can and will assist in distributing it. If it would be more convenient send us the names and addresses of everybody you can think of who would be interested.

INFECTIOUSNESS OF MILK.

We have recently received from the Secretary a copy of a report made to the Trustees of the Massachusetts Society for Promoting Agriculture on the infectiousness of milk, especially that from tuberculous cows with no lesion of the udder, by Dr. Harold C. Ernst, Bacteriologist of the Harvard Medical School. The results of Dr. Ernst's investigations are so interesting and valuable that, inasmuch as his report will hardly come under the eye of most of our readers, we feel that we will be doing them a pleasing service in giving them a summary of it, short and imperfect as it must be from want of space. After certain preliminary remarks he says:

"The desire of the committee was to determine whether or not the milk derived from tuberculous cows might contain the infectious material of the disease, and in this way become dangerous when used as an article of food. And this question was of necessity to be divided into two parts: (1) Whether this infection, if it existed, was confined to cases in which there was actual disease of the udder, and (2) whether it might exist in cases in which the udder was apparently or actually healthy, but the disease existed in other parts of the body.

"In regard to the first part of the question plain common sense showed that the danger of infection was a real one, and besides this, there existed at the time sufficient experimental *data* to prove the fact, so that there is very little dispute that, under the circumstances, milk should not be used for food, certainly in an uncooked condition. Evidence since then in the same direction has constantly accumulated, and now there is hardly a dissenting opinion that milk from cows with tuberculosis of the udder should be condemned for food.

"Upon the second point, however, as to whether the milk from cows with tuberculosis, but not of the udder, might be dangerous, there was a great diversity of opinion, and almost no experimental evidence upon which to base what opinion there was. It was in this direction, therefore, that it was especially desirable to obtain evidence, and after considerable discussion it was decided that the main line of experiment should be so conducted that this point might be decided. In this, as in everything else, it is to be remembered that one piece of positive evidence obtained under proper conditions is worth many negative results, and it is for this reason that so much value may be attached to the results which have been obtained. These were published in an incomplete form and have been widely disseminated. * * * It is unquestionable that they have had much influence in moulding public opinion in this matter, and at least one direct result has been the inspection of the herds of cattle in New York by the Board of Health of that State.

"The work, then, was undertaken with this special end in view —to determine *whether the infectious element of tuberculosis ever existed in milk from tuberculous cows whose udders were apparently healthy*, and was prosecuted under the following headings: 1. *A careful and persistent microscopic examination of the milk from such cattle.* 2. *Inoculation experiments with such milk.* 3. *Feeding experiments with the same milk.* In addition to these three main lines of investigation there was also undertaken: 4. *Similar investigation of the milk supply of Boston*, and 5. *The gathering of as much evidence as possible from medical men and veterinarians as to cases of probable infection through tuberculous milk that had come under their observation.*"

These investigations were made with extreme carefulness, every precaution being taken to have them as free from doubt as possible.

I.

"*Cover-glass examinations of milk from cows affected with tuberculosis, but, so far as the best veterinary examination could determine, with no disease of the udder.*"

A summary of the results of this line of investigation, as given in Table I., is as follows:

"There were 121 examinations of milk and cream made, the specimens coming from 36 different animals. The bacilli of tuberculosis were found in one or more cover-glasses upon 19 different occasions.

"These 19 positive results were obtained from 12 different animals, and the bacilli were found in about equal proportion in the milk and the cream; they were seen more than once in milk from the same cow, at different examinations, 6 times. The bacilli were actually seen, therefore, in specimens from one-third (33 per cent.) of the animals examined. That these animals were actually affected with tuberculosis, and that the udder was free from disease, was proven in all possible cases by careful *post-mortem* examinations. These were conducted upon 20 out of 36 animals shown in Table I.

II.

"*Inoculation Experiments upon Animals.*"—The animals used were guinea-pigs and rabbits. The results of this work are set forth in detail in Tables II. and III. and are summarized as follows: "There were 88 guinea-pigs inoculated with milk from 15 different cows; tuberculosis was found in 12, and these results came after the use of milk or cream from 6 different animals. * * *

Ninety-five rabbits were used for the same purposes and under the same conditions as were the guinea-pigs. Of these rabbits 5 were for various reasons useless for the purposes of the investigation, leaving 90 which were subjected to full examination. For these 90 animals milk from 19 different cows was used one or more times, and tuberculosis was found in 6 animals inoculated with milk from 4 different cows. These results show a less proportion of apparent infection of milk as demonstrated by the inoculation experiments than appeared to be the case in the microscopic examinations. But this difference, even granting that they were *all* the results of the inoculations, is no more than might be expected and explained by causes beyond control."

III.

"The third line of experiment was in feeding the milk from tuberculous cows and healthy udders to different series of animals. Here, again, the greatest precautions were taken against outside infection, and it is believed that these were as free from sources of error as it is ever possible to make such experiments. They were carried on upon rabbits, pigs and calves, and the statement of the experiments is shown in Tables IV, V and VI." Summaries of these tables are as follows:

"*Milk-feeding Experiments upon Rabbits.*—There were used 48 animals, with positive results (tuberculosis) in two, and both of these animals were fed upon milk from cow E ; No. 12, one nodule in lung after 31 days ; No. 28, one nodule in liver after 97 days. This is of course a very small proportion of positive results, but the following table shows a very different condition of affairs, that is especially striking for the reason that pigs are not believed to be unusually susceptible to tuberculosis under ordinary conditions.

"*Milk-feeding Experiments upon Pigs.*—Twelve healthy animals were used with positive results (demonstration of the bacilli under the microscope) in five. In two others nodules presenting the gross appearance of tuberculosis were found, but the material was not saved for microscopic examination. In any case nearly 50 per cent. of the animals were shown to be tuberculous.

"*Milk-feeding Experiments upon Calves.*—For the purposes of the third series of feeding experiments calves were bought as young as possible, and from as healthy parentage as could be found. There were 25 calves used in this series of experiments, but of these 4 are to be excluded from the count, leaving 21. Of these 21 animals 8, or over 33 per cent., were shown to be tuberculous.

"It is of course true that pigs and calves, that drink milk much more freely than do rabbits, are more susceptible to infection by the gastro-intestinal tract, and that this may explain the far greater proportion of positive results in these two species of animals.

"*Examination of Cows Used for Experiment.*—Twenty-three cows were used for the feeding experiments, and in not one of them did the most careful macroscopic and microscopic search show any sign of tuberculosis of the udder except in one, and in this case a single giant cell, containing one bacillus, was found in one section, and no other indication of tuberculosis anywhere else in the udder.

"An exceedingly interesting piece of evidence as regards the hereditary nature of tuberculosis is found in the history of 19 calves born of the tuberculous cows with healthy udders. Of these 19 calves, all killed within 6 days after birth, not one showed any detectable evidence of tuberculosis, and a most careful search was made in all cases. So that this certainly seems to point away from any very active transmission of tuberculosis from the cow to its offspring."

IV.

"*Milk Supply of Boston.*—As an interesting corollary to the work already detailed a series of microscopic examinations and inoculation experiments were made with milk taken at random from the mixed supply of the city of Boston. * * * There were 56 examinations made of the milk and cream from 33 samples, with the result of demonstrating the presence of the bacilli of tuberculosis once. Twenty-five rabbits were inoculated with this milk, mixed, with the development of tuberculosis in three.

"Of course these results, obtained in milk from a mixed source are not as conclusive upon the especial point toward which the main line of investigation was directed—as to the presence of the bacilli of tuberculosis in milk from cows with healthy udders—but they certainly tend to demonstrate that there may be this infectious element in any milk supply from uninspected cattle."

V.

"The last of the lines in which investigation was made was to endeavor, if possible, to obtain clinical reports of cases of transmission through milk from mother to offspring. * * * A circular was sent out to about 1,800 medical and veterinary gentlemen, in an attempt to discover any clinical cases bearing upon the subject at hand." To this circular replies were received from 937 physicians, of which 19 were positive as to the transmission and 16 suspicious. "Counting all the positive and suspicious cases together, there are 35, and the percentage of those who have seen cases in which their suspicions have been aroused in this direction is 3.7—a result that is as unexpected as it is surprising in its size, if one takes into consideration the difficulties surrounding the question, and the newness of the subject." Fifty-four replies were received from veterinarians, which gave a percentage of 42.59 *plus*. "Such a percentage is startling in its size, until one remembers the greater facilities that veterinarians have for observing such cases and their origin, when it does not seem so much out of the way—granting that milk may be the vehicle for the disease that the experimental evidence offered in this paper tends to show that it is.

"Combining the statistics obtained from the two sources, it appears that there were 991 answers received to the circular-letter that should be counted, and that among these there were 58 gentlemen who have seen, or suspected, the existence of such cases as were inquired about, giving a percentage of 5.84 *plus*, which seems to be somewhat remarkable for the reasons already given."

While the facts above given are extremely interesting, suggestive and valuable, we trust that our readers will not forget the plain, old-fashioned, every-day infectiousness of milk, with which we are all familiar, and which in our opinion does not receive the attention it deserves. It is needless to say, particularly at this season, that we refer to the dangers arising from fermentative and putrefactive changes due to heat—and uncleanliness. Not forgetting tuberculosis, let us bear especially in mind cholera infantum and the other allied complaints which make the parents of every artificially fed baby dread the approach of summer, and impress upon the people, as far as possible, the extreme importance of the greatest care in the management of milk intended for infants.

BACTERIOLOGICAL EXAMINATIONS.

At the conjoint-session of the Board with the State Medical Society at Greensboro, in May, 1894, Passed Assistant Surgeon J. J. Kinyoun, who was present by invitation as the representative of the United States Marine Hospital Service, announced that the Service would be glad to give, in its laboratory at Washington, free of charge, a six-weeks' course of instruction in practical sanitary bacteriology, directed particularly to the biological examination of drinking waters, to duly accredited representatives of our Board. Drs. Albert Anderson, of Wilson, and W. T. Pate, of Gibson Station, promptly signified their desire to avail themselves of the opportunity. They were duly appointed, and in January of the year 1895 went to Washington, where, at their own expense, they spent the full time in practical study and work under the immediate instruction of that eminent bacteriologist, Dr. Kinyoun.

Since their return they have each fitted up a laboratory and are now prepared to make biological examinations of drinking waters, and in suspected cases of tuberculosis and diphtheria. In acknowledgement of the courtesy of the Board in appointing them as its representatives they have agreed to a special arrangement for official work in drinking waters. Owing to our very small appropriation, we are under the necessity of issuing permits for such examinations at the expense of the Board with much circumspection. To insure this, any physician suspecting a water as the cause of disease must first submit the matter to his County Superintendent of Health, or to the *Medical* health officer of his city or town, if it have one, who will write the facts and his opinion as to the necessity for the examination to the Secretary, and if in the latter's judgment the expense would be justified, a permit, with instructions for taking sample, will be sent to the applicant. Examinations made on this permit will be paid for by the Board, but in every instance express charges must be prepaid by sender. County superintendents will please bear in mind the necessity for careful inquiry into all the facts before advising an examination, for the reason above stated. We would be very loth to refuse an application endorsed by a superintendent.

To our readers who are members of the State Medical Society Drs. Anderson and Pate need no introduction, but to those not acquainted with them it is proper to say that they are among the best men in that unusually strong body. Intelligent, earnest, painstaking, scientific, they are worthy of confidence, and we trust that they may receive such support in private work (in regard to which information must be obtained from them direct) as will encourage them to persist in their valuable labors on this line.

In conclusion, we desire to express our appreciation of the enterprise and self-sacrifice shown by the gentlemen alluded to in this matter. It is now well known that the specific pathogenic qualities of infected drinking water cannot be ascertained with certainty by any other method than a bacteriological or biological examination, and it is a great gratification to feel that we have, right here at home, men competent to do this important work, associated with the Board.

PURIFICATION OF SEWAGE-POLLUTED WATERS BY SAND FILTRATION.

Those of our readers who do not see the admirable journal of the Massachusetts Association of Boards of Health, will, we feel sure, thank us for giving them the pleasure of reading the following most interesting extract from a paper on the above subject read by Prof. W. T. Sedgwick, at the April quarterly meeting of that body:

"With regard to the purification of sewage-polluted waters I will say only a word or two. The matter may be stated rather briefly, something like this: Why do we attempt to purify sewage-polluted water? For two reasons: First, because such water is a nuisance; and, second, because it is apt to be dangerous to the public health. It certainly is dangerous to drink.

"How shall we go to work to purify it? Well, how does nature go to work? If the farmer puts upon his field barn-yard manure year after year, giving it a heavy dressing of the material, this is easily taken care of by the mother earth. No one knows or thinks that the farmer is creating a nuisance, the odor is not objected to by anyone. On the contrary every one of us feels a sort of primitive agricultural delight in the smell of good barn-yard manure thus utilized, and we have no objection to living in the neighborhood. I have seen the lawns on Commonwealth avenue in Boston so covered with stable manure that one had almost to hold his nose in passing, and yet the same people who do not object to that odor would complain most bitterly of the slightest odor coming from a garbage pail or anything else of equally unsavory nature or origin. We know that the earth takes care of this organic matter. And the same is true of the conditions of the ordinary untidy country house or the tenement house, where the housewife, to get rid of her dish-water or slops, throws them out of the window. Unless that is done in excess, or for too long a time and under unfavorable circumstances, the earth takes care of all the stuff thus thrown out and little or no trouble ensues. Here is a hint for the doing of the whole thing. The earth is capable of taking care of the organic matter, provided it does not have too much of it or have it for too long a time without change.

"We have arrived at this conclusion by experimentation. As long ago as 1839 London began to filter the highly polluted water of the river Thames through sand filters. It was supposed that by simply straining out the suspended matters and some of the dissolved matters the water would do no harm. Bacteria had not then been heard of. But time has gone on, and it has been found by making a study of the affair that, by putting sewage polluted water on the land, with the right kind of soil, you can dispose of sewage on land as the farmer disposes of his barnyard manure; or, on the other hand, in the case of sewage-polluted water, that a larger volume of water can be treated, and then recovered through an underdrain and used for drinking.

"An example of the first case, the city of Berlin, a city of a million and six or seven hundred thousand population, disposes of its sewage upon the land. The river Spree runs through the city, but does not receive the sewage except in times of storms, when the overflow goes into the river. The sewage ordinarily is disposed of upon the land: and the same principle is applied as here in Brockton—namely, the putting of a thin layer of sewage upon the soil, and letting the earth take care of it. In the case of Berlin they make use of the sewage impregnated soil to raise crops; but, when you commence to raise crops at the place where the filtering is going on, you must remember that you cease to operate the filter to its highest capacity. In Berlin they raise cabbages and other vegetables, where the sewage of sixteen or seventeen hundred thousand people is disposed of on the land: and the effluent water, as it comes out below, is used for drinking. Here is an instance of the disposition of sewage in this way on a large scale. And if any one says that Brockton's plan is only an experiment, and that no one can say how long it is going to continue satisfactorily, or how it will be in fifteen or twenty years from now, we may reply that Berlin has been doing the same thing for years, and there is no uncertainty about it: that the mother earth, when the place is rightly chosen and the operation is properly managed, will take care of any amount of organic matter which you may wish to put upon it.

"When you come to water purification, there is the same problem with certain modifications. Sewage is water gone bad, water with excess of foul matters—such as we saw to-day—which sewage was not ordinary sewage, but thinner, yet for my purpose answers well enough, because I may point to those filter-beds, and show you sewage-polluted water purified there by sand filtration. It was sewage, so called. It was really sewage-polluted water; and that is what sewage always is. The sewage of Berlin is so polluted that it becomes almost as black as ink, and is thick as thin mud. I have seen it of that character on the filter fields of Berlin, like thin black mud or thick ink. Now in such a case, ordinarily, there is one unfavorable condition: the sewage does not contain any oxygen. These filters are not strainers, they are not mere heaps of sand; but when in good working order, they are rather like living organisms, for they are filled with bacteria which breathe and feed, taking up the organic matters of the sewage.

Oxygen being available, the bacteria resident in the sand feed upon the organic matters, and reduce them to similar matters of a mineral sort, and their organic character is lost. It is as if those filter beds were a gigantic living sponge. You know the sponge before it is gathered is a living mass permeated by narrow channels. And if we imagine one of these filters to be a heap of sand swarming with living bacteria, we can see how easy it is for the sewage-polluted water to flow into this great sponge, and for the living contents of the latter to feed upon the matters it contains. When the filters are water filters, they work more freely, because ordinary water is saturated with oxygen.

"The theory becomes comparatively simple when looking at these filters, if one does not regard them as mere sand, but rather as something which would remind us of London and Paris with their dense populations, great centres teeming with multitudes of individuals. The sewage that arrives they receive with open arms, taking from it the organic matters which are their food, and working them over into mineral matters, which, in solution, pass off below. So the purification of sewage-polluted water is pretty much the same thing as purification of sewage, only the work is done faster because of the oxygen in the water. You have an example of this in the city of Lawrence, where you have heard of the municipal filter designed by Mr. H. F. Mills, of the State Board of Health. That city is now supplied with water fit for drinking, purified by simple sand filtration in a bed two and a half acres in extent. It is not merely a bed of sand, but contains a vast multitude of bacteria, feeding there upon this impure water, which, after it is filtered, goes into a reservoir pure and clear. We may see how the thing works as far as can be seen with the naked eye, but for scientific purposes we must take a microscope, and we shall then find every grain of sand in this great filter coated with bacterial jelly, and bacteria actively at work doing their part in the process. If we wish to see what has been accomplished in this way, we can compare the death-rate in Lawrence as it is now with the death-rate which prevailed before the filter went into operation. Lawrence, instead of standing higher than any other city in the Commonwealth in deaths from typhoid fever, as it did, stands now on a par with those cities which are furnished with a good water supply and having similar industries and climate; and its bad reputation as a breeder of typhoid fever has disappeared. Typhoid fever is no longer "endemic" in Lawrence; it is only occasional and sporadic, as it is in Haverhill, Brockton, Lynn, and all other cities with good water supplies. There are a few cases arising from the use of water taken unfiltered from the river, and a few imported cases, and also cases from using bad milk and from other sources; but the death rate of Lawrence from typhoid fever now compares favorably with that of other cities of its own size, character and situation having perfect water supplies. In other words, sewage-polluted water that is purified, is not objectionable, but safe. The same thing is true of London, which for many years has been supplied with sewage-polluted water thus purified. The death rate of London from typhoid fever is very low.

"In looking at these so-called intermittent filters, then, one should take out of his mind any idea that they are mere heaps of sand. Every grain of that sand has on it thousands of bacteria which have taken up their residence there in a jelly-like form, so that the total effect is softness of the soil, because of this great aggregate of bacterial life. It is bacterical life which takes care of the farmer's manure spread upon the earth, and of the dish water thrown out of the window by the careless housewife, and of the sewage which is spread on fields, as you have seen it to-day."

COUNTY SUPERINTENDENTS.

The regular biennial meetings of the county boards of health for the election of county superintendents under the Act of 1893 occurred on the first Monday of the present month. Although we took the precaution in our notice of the meetings to call special attention to the fact that according to the decision of the Attorney General a majority of all those eligible to membership was necessary to constitute a legal meeting, and urged upon the physicians the importance of attending and keeping in their own hands the selection of their superintendent instead of letting it go by default to the county commissioners, it happened in several instances that a quorum could not be obtained. We regret this greatly—as we regret anything that shows a lack of interest on the part of our medical men in sanitary matters.

As the result of the elections we have twenty-eight new superintendents. We trust they will all fully meet the grave responsibilities laid upon them. We have been asked for a statement of the duties of a county superintendent. They are laid down so explicitly in the law, a copy of which we will send them together with other publications and blanks, that it would be superfluous to repeat them here. We feel, however, that it would not be amiss to impress upon them the vital importance of promptly carrying out the law in regard to quarantine and disinfection in contagious diseases, especially scarlet fever and diphtheria, under no circumstances permitting the omission of the posting of the placard. We mention this particularly because it has been done, on the ground that it might produce a panic, as if a panic, so far as the infected house is concerned, is not exactly what we desire to produce. In this connection the fear has come over us at times that in cases in influential families who objected, the attending physician might not always report them to the superintendent as promptly as the law requires (within 24 hours) and that possibly the latter might not in such instances that come to his knowledge be invariably as firm as he ought to be. But the duty of both attending physician and superintendent of health is so plain and so urgent to any conscientious man that we shall dismiss the fear.

The relation between the outgoing superintendents and the secretary has always been so harmonious and agreeable that we see it severed with regret. We would request them to turn over promptly to their successors all blanks and placards they may have on hand together with such suggestions as their experience in the office justifies. And we would thank the new incumbents, after this is done, to notify us of any deficiencies in their outfit that we may immediately make them good.

HEALTH CONFERENCE.

On the 6th of next month the State Board of Health proposes to hold a health conference with the people at Washington. The pronounced success of the one at Salisbury in September of last year, as shown not only by the interest evinced by the community in the meetings at the time, but also by the lasting impression made upon it, as we are informed by residents of the town, encourages us to hope for good results in the east. A number of papers are in sight.

We earnestly hope, as it is beyond the power of the Board to hold these meetings in every county, that the attendance will not be limited to citizens of Washington and Beaufort county, but that numbers from the contiguous counties will also participate. The papers will not be technical, but popular in character, and after a subject is introduced by the reading of one, members of the audience will be requested to ask questions and the Board will answer them. We would thank our readers in the section alluded to to spread the above mentioned facts among their neighbors and induce them to attend by leading the way.

Wednesday, November 6th.

AMERICAN PUBLIC HEALTH ASSOCIATION.

Want of space forbids an extended notice of the twenty-third annual meeting of the American Public Health Association at

Denver, October 1—4, but we desire to place on record our appreciation of the cordial reception and abounding hospitality shown us by the citizens of that beautiful and wide-awake city. Dr. Sewell, the chairman of the committee on arrangements, was untiring in his efforts to give pleasure. Among other entertainments arranged for us was a trip to Manitou, Pike's Peak, the Garden of the Gods and Colorado Springs. The weather report at the signal station on top of Pike's Peak. 14,147 feet above sea level, the morning we were there, October 5th, was: snow fall 3 feet, temperature 22°, wind 40 miles an hour. The weather during our stay was, for the most part, beautiful, but one day we had, to quote our famous humorist of Buck Shoals, "Climate enough for a town twice the size." It is an interesting country in some aspects, but we must confess that we came home a hopeless "tenderfoot."

Owing to the great distance from the centres of population the attendance was not so large as usual, nor were the scientific proceedings, on that account, altogether as interesting. Dr. Liceaga, the leading sanitarian of Mexico, was elected president, after several tie ballots with Dr. Horlbeck, of Charleston, S. C. The next meeting will be in Buffalo, N. Y.

RESPONSIBILITY OF PHYSICIANS IN CONTAGIOUS DISEASES.

While in attendance upon the recent meeting of the American Public Health Association at Denver, we were told by the secretary of one of the State Boards of Health the incident mentioned below. It made a deep impression on us at the time, but since our return certain information which we have occasion to believe is trustworthy, has come to us that leads us to fear that some of our own physicians may be making the same fatal mistake. This fear has deepened the impression referred to and constrains us to place it before our readers. In view of the high character, intelligence and conscientiousness of the profession as a whole, it cannot be that such things happen often, but they are so pregnant with all that is associated with suffering and death—made a thousand times more bitter by the needlessness of it—that a word of warning cannot come amiss. But to the story.

In a certain town, which shall be nameless, there live two families opposite one another on the same street. There are children in each, the mothers are intimate and dear friends, and a day does not pass that the families are not more or less together. Recently a child in one was taken sick. The attending physician diagnosed the case as scarlet fever, but as it was a very mild case said he did not think it worth while to make an alarm by mentioning it. The children of the family opposite, several in number, visited the little sick friend daily, no one dreaming of danger. They all took scarlet fever and one died. The first time the stricken mother met the physician of the first case she upbraided him with, "Doctor, you killed my child." He attempted to excuse himself, but to the mother-heart, mourning in bitter agony over the needless sacrifice of her child that might have been so easily prevented, there could be no excuse. "Doctor," she repeated, "you killed my child. If you had told my friend that her child had scarlet fever, she would never have permitted my children to enter her house." What an awful accusation! How these words must ring in his ears, and what a pang, if he is not devoid of feeling, the sight or mention of that mother must always bring to his heart!

Now, in this case, the motive of the physician was doubtless in a certain sense a praiseworthy one—the indisposition to say or do anything disagreeable—but that fact cannot erase the dreadful consequence of his failure to do his plain duty. That the attack was a "mild" one, which was urged as an excuse, was of course no excuse at all, for any physician who has learned the a, b, c of medicine knows that the disease can be contracted from a mild as well as from a severe form, and no man can predict what course the secondary case will pursue.

But the duty of the attending physician to sound a note of warning is not restricted to cases in which the diagnosis is plain. Whenever there is any doubt about the diagnosis, as, for instance, in a supposed case of roseola where scarlet fever is known to exist in the community, it is clearly his duty to insist upon the observance of every precaution at least until sufficient time has elapsed for desquamation or its absence to settle the matter. He has no right to take any chances when such serious consequences are involved—to stake the comfort and convenience of his patron against the possible loss of innocent lives. And when the diagnosis is practically certain, it does seem to us that a failure to promptly take steps—every available means—to prevent the spread of the disease would amount to criminal negligence. It may be considered a rather strong expression, but we hold ourself ready to defend the assertion that any physician who knows that he has a case of contagious disease of a kind liable to produce death and who neglects to have carried out to the very best of his ability every sanitary precaution to prevent its spread *gambles in human life.* How any man can assume the terrible responsibility of a failure to do this simply passes our comprehension.

TYPHOID FEVER FROM IMPURE DRINKING WATER AT WILMINGTON.

BY GEORGE G. THOMAS, M. D., PRESIDENT N. C. BOARD OF HEALTH.

On the night of the 28th of November last a number of young ladies and gentlemen attended a dance at Germania Hall in Wilmington—an impromptu gathering, which was intended as an entertainment of the members of the foot-ball team which had played a match game in that city in the afternoon preceding the dance. The regular janitor of the hall was absent and a careless and ignorant man was put in his place. A half block below the entrance of hall is a dock in the river into which empties a sewer, draining the closets and waste water of eight or ten blocks. From this dock it appears probable that the water was taken near the point of the wharf, a distance from the mouth of the sewer of about twenty feet, and where the sewerage mixes with the river stream. It is likewise asserted that there was in the cooler into which this river water was poured for use, some water that had been in this receptacle since last April. The janitor on the occasion admits that he brought up some water from the river, but says that it was used to do washing about the hall, and he asserts that the drinking water was obtained from a driven pump in the next block, in the yard of Mr. Haar. Within a week after the dance three young ladies and one gentleman were taken sick. Two more young men sickened within the three weeks following the dance, and we give a brief summary of the cases as best we can below.

1. Miss D., aged 20, was taken sick three days after the dance, and her physician thought she had an attack of influenza. On the fifth day there were marked typhoid symptoms, notably a persistently high temperature. She had a slight diarrhœa and tympany, but there was intense headache, attended at first by hebetude, later by delirium. On the thirteenth day pneumonia developed, and intestinal hemorrhage occuring on the sixteenth day brought on the fatal issue.

2. Miss H., aged 19. Had an entero colitis beginning the day after the dance. This yielded to treatment and in a few days she was up, and attended during the week the following two entertainments. About ten days after the first attack she was seized with fever, of a marked typhoid character, but promising to be mild. The fever declined rapidly and was immediately followed by a gastritis. This, in turn, was checked by rectal feeding and appropriate medication. As soon as the patient was allowed to take food by the mouth, a duodenitis was declared compli-

cated by a swelling of the orifice of the common duct. The gall bladder was quite much enlarged, and pain and nausea, with slight jaundice, accompanied the complications. The subsidence of the duodenitis was comparatively quick, but the fever persisted attended by great prostration. On the twenty-second day a general peritonitis following a period of depression, probably the shock attending a perforation, rapidly closed the life of this young lady.

3. Miss P., aged 18. Had a diarrhœa and probably some fever for the two weeks after the dance, but she was not seen by a physician until the end of that time. Diarrhœa was then slight and followed by constipation. The initial chill of the typhoid fever, was probably on the fourteenth day after the dance. This case was very mild, and atypical. Temperature range was low; there were no nervous symptoms except a severe headache and backache, no tympany, and no delirium. There was a slight diarrhœa after the administration of medicine to relieve the constipation. The patient made a good recovery, the fever leaving her on the twenty-first day from the chill.

4. Mr. P., aged 20, was at home from the University for Thanksgiving day, attended the dance, and went back to the University the next day. He was sick but not confined to his room; too unwell, however, to attend actively to his college duties. He came home for the Christmas holidays and was taken down with a fever that was like the last one reported, mild in type, but which lasted quite three weeks. He made a good recovery.

5. Mr. H's case, age not known, was very much of the same character as case 4.

6. Mr. C., aged 21, was taken sick within a few days after leaving Wilmington. He was dangerously ill for some days, but made a final recovery.

The cases are thus briefly mentioned, because they all were in general affected in the same manner.

There are only two sources from which the water supply might have come—the river at the dock, or the well at Haar's store. But there is no reason to suppose that Haar's well was infected, as it is used by his household and quite a number of small stores in the neighborhood, and there has been no report of sickness from the persons using it.

We submit the report of Dr. Pate, the bacteriologist of Gibson Station, made at the request of Dr. A. H. Harriss, the Superintendent of Health of Wilmington. Four samples were sent Dr. Pate. 1. Water from the dock at half flood. 2. Water from Haar's well. 3. Water from the hydrant of the city water works. 4. Water that had been in the cooler in Germania Hall for ten days.

Although no typhoid fever germs were found by Dr. Pate, it is to be remarked that the dock water contained large quantities of intestinal bacilli, and these may have been the cause of the fever, and probably were, as it is now claimed and generally admitted that the common bacillus of the colon under favorable circumstances may aid in the development of the typhoid germ

At any rate the action of the careless janiter was followed by a terrible calamity—the sacrifice of two beautiful young women, the darlings of their respective families, and endangered the lives of four other young people.

The report of Dr. Pate is quite complete and he has dealt with the water submitted to him in a most exhaustive manner.

GIBSON STATION, N. C., February 15, 1896.

Dr. Geo. Gillett Thomas,
President State Board of Health, Wilmington, N. C.

DEAR SIR :—I have the honor to submit the following as a report of the bacteriological examination of the four samples of water collected and sent to me by Dr. A. H. Harriss, Superintendent of Health for Wilmington, N. C., February 3, 1896.

The examination shows that the bacteria in all of the samples are benign forms except those in the river water. No. 1 sample from pump at Haar's store, when first plated in the usual quantities, developed only two colonies of bacteria, and I iound it necessary to plate this sample again. This was done after leaving the bottle standing for five days. Then the water was thoroughly mixed by shaking the bottle, and larger quantities plated than usual with the result indicated in the table, viz: 150 bacteria to the cubic centimetre of water. The number of bacteria in this sample is very low for pump water in city soil, and doubtless other samples from the same source would show the general average to be greater.

No. 2 sample from hydrant near Haar's store gives 5,700 bacteria to the cubic centimetre of water which would indicate an abnormal amount of germ food in the city water supply.

No. 3 sample from cooler at Germania Hall gives 9,000 bacteria to the cubic centimetre of water. This water stood in the cooler several days, and it is probable that the increase in the number of bacteria was caused by their multiplication during this time.

No. 4 sample from river contains intestinal bacillus.

Respectfully submitted,

W. T. PATE.

Table Showing Results of Bacteriologic Analyses of Four Samples of Water from Wilmington, N. C.

No	Source	Date	No. of Bacteria to 1 C. C.	Fermentation Test		Wurtz's Litmus lactose-agar	Gelatine	Motility	Reaction		Litmus Milk	Potato	Indol	Remarks
				Lactose	Glucose				Lactose Bouillon	Glucose Bouillon				
1	Pump at Haar's Store	Feb. 3, 1896	150	Does not ferment	Does not ferment		Pale Blue Colonies Does not Liquefy	Active	Acid	Acid	Not coagulated, ninth day heliotrope	White, elevated, moist	None	
2	Hydr'nt near Haar's Store	do	5,700	do	do		Brown'h Colonies Does not Liquefy	do	do	do	do	do	do	
3	Cooler at Germania Hall	do	9,000	do	do		Brown spreading colonies Liquefi's	do	do	do	do	Yellowish, moist, spreading	do	
4	River	do	Innumerable	Ferments	Ferments	Red colonies	Yellowish, spreading colonies does not Liquefy	do	do	do	Coagulated Third day pink	Yellowish, dry	Considerable	Intestinal bacillus

NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

Together with President Thomas we attended the meeting at Chicago, on the 10th–12th inst., of this, in our opinion, the most useful of all the sanitary organizations of the country. Its membership up to the present time has been limited to the State and Provincial boards of health of the United States and Canada, but at the recent meeting an amendment to the constitution admitting the corresponding bodies of Mexico and the officers of the Marine Hospital Service, which will no doubt be adopted at the next meeting. This, however, will not change the character of the *personnel*, as the new members will be all active, practical health officers.

The programme, embracing papers and practical subjects for discussion, was too long for reprinting here, but we were particularly pleased with a report by Dr. Schwarz, the talented Secretary of the Rhode Island Board of Health, on the certain experiments and observations on the filtration of water. We hope to give our readers the benefit of some extracts from this valuable report when it is published. One of the most important matters brought before us was the report of the committee on the establishment of a national department of health—a subject which has engaged the attention of the American Medical Association and various sanitary bodies for some time. When it was discussed at the conference held in Washington City in December, '94, North Carolina was practically alone in advocating the amplification of the powers and work of the Marine Hospital Service, on the ground that it was already in existence, was well organized and, in our opinion, well managed, composed only of men selected on merit who devoted their lives to sanitary work, and so organized as to be entirely free from the control of politicians. So we were naturally gratified when we heard the report, which was unanimously adopted, recommending this very thing, with proper safeguards, of course, to prevent undue interference with State Boards, including an advisory board composed of one member from each State Board, to meet annually in Washington with the officials of the Service.

On Wednesday night Mr. Lyman E. Cooley, at one time the chief engineer of the work, gave us an extremely interesting account of the great drainage canal of the Sanitary District of Chicago. It is to be over thirty miles in length, emptying into the lower Desplaines river and thence through the Illinois into the Mississippi. Eight miles is through solid rock; the width at the bottom in that part is 160 feet, with nearly perpendicular sides, and the width at the bottom in the earthen portion 202 feet, with sloping sides. It is designed to carry 600,000 gallons of water per minute, thereby accommodating a population of 3,000,000, and will float any vessel drawing less than twenty-two feet. To give us a concrete idea of the magnitude of the work, he stated that the stone taken out would build four pyramids as large as the great pyramid of Egypt, and the total amount of material removed, if dumped in forty feet of water, would make an island a mile square, showing eight feet above the surface, or would load a freight train 26,000 miles long—more than long enough to encircle the globe. The main body of the canal is finished, nearly $22,000,000 having been expended up to May 1, '96. It is hoped that the terminals will be completed and the canal in operation in about a year.

The next day we were placed in charge of the genial Dr. Reilly, the Assistant Commissioner of Health, on excursion to view this gigantic work. At Willow Springs, half way down the canal, we were disembarked and served with an elegant lunch, which included a full account of the work from Mr. Eckhart, the President of the Board of Trustees, and a very happy response from Dr. Ruggles of California, the newly-elected President of the Conference, after which we proceeded to view "the big ditch." We were greatly interested in, and impressed by, the wonderful machinery especially designed by American ingenuity for the performance of this particular work.

The following day we were taken to the "cribs"—the intakes of the city water supply—one situated two and the other four miles out in the lake. As our boat passed through the Chicago river, which now receives the sewage of the city, we saw the water apparently boiling in places from the fermentation of the filth, and when we were informed that the water at the four-mile crib had been contaminated several times we could well understand the necessity for the gigantic undertaking of the drainage canal for the sewage, the crowning work of the most enterprising city on earth.

In conclusion we desire to make our acknowledgements to Dr. Scott, the Secretary of the Illinois Board of Health, Dr. Reilly and the other city officials, including the jovial Mr. O'Neill, the veteran alderman. Great is Chicago!

THE PAN-AMERICAN MEDICAL CONGRESS.

The meeting of the second Pan-American Medical Congress will be held in the City of Mexico, November 16th to 19th, inclusive. Dr. Reed, *ex-officio* Secretary of the International Executive Committee, says in a recent letter: "The enthusiasm with which not only the medical profession, but the Government of Mexico, has taken hold of the proposed meeting, guarantees its success. Judging from the statements of those who attended the meeting of the American Public Health Association in the same city in '92, an extremely interesting and enjoyable trip is assured, to say nothing of the scientific value of the Congress. Any one wishing to attend can obtain detailed information by addressing Dr. Charles A. L. Reed, *ex-officio* Secretary, St. Leger Place, Cincinnati, O.

RICHARD H. LEWIS,
Vice-President for North Carolina.

TYPHOID FEVER.

The fact that nearly twice as many counties reported typhoid fever this month as did last suggests the advisability of calling attention again to the importance on the part of both physicians and householders of carefully looking after the means of preventing its spread. When it is remembered that 50,000 people die annually in the United States from this disease, of which North Carolina's quota would be about 1,000, to say nothing of constitutions shattered, of the suffering, anxiety, expense and loss of time, the gravity of the subject is apparent and no excuse for repeatedly directing the attention of both the profession and the people to their duty in relation thereto is necessary. Enteric fever is by long odds the most fatal of all the preventable diseases which occur within our borders. And it is undoubtedly preventable, in large measure certainly, and, too, by very simple and inexpensive methods. That the drinking water is the medium of transmission in an immense majority of the cases, and that the water is contaminated by the undisinfected bowel discharges of another case is practically demonstrated. So that the preventive measures necessary may be summed up in an immediate change to a water supply clearly beyond the risk of contamination, or boiling the home supply, and in promptly and thoroughly disinfecting the bowel discharges and the soiled linen. Simple and cheap methods of doing this are clearly set forth in the "Instructions for Quarantine and Disinfection," as well as in the pamphlet entitled "The Importance of Disinfecting the Bowel Discharges in Typhoid Fever," both of which have been widely distributed by the Board. But they have necessarily reached only a very small proportion of the people, and then in most instances when, there being no typhoid or other infectious disease present in the family or immediate neighborhood of the reader, they would probably make comparatively little impression. If, however, the enemy is in sight, or, still more, if he has already attacked one of our own dear ones, we would read with much care and appreciation, and earnestly put into energetic action, the instructions given for conquering the dread invader. With this idea in mind we have mailed to those superintendents reporting a number of cases of typhoid a package of the pamphlets on that subject, and we earnestly hope that they will see to their prompt distribution among the families having the disease and those near by and liable to become infected. We also beg every one of our readers who knows of a case of typhoid fever in his neighborhood to send us the address of the head of the family that we may mail him direct pertinent sanitary literature, or inform us how many copies he will personally distribute. We are extremely anxious to strike while the iron is hot, that we may make as deep an impression as possible; but we can't strike the iron if we do not know where it is. Won't you do this, and not improbably by writing a few lines on a postal card save one or more lives?

In order to assist in locating the origin of typhoid fever, and checking its further spread when occurring in more or less epidemic form. (the means at the disposal of the Board would not permit it in sporadic cases,) arrangements have been made with Drs. Albert Anderson, of Wilson, and W. T. Pate, of Gibson Station for bacteriological examinations of suspected drinking water. On the back of the permit for this analysis the following appears:

"Parties desiring a bacteriological examination of drinking water must first apply to the Superintendent of Health of his county, (or to the *medical* health officer of his city or town if it have one) who will, if in his opinion there be just cause to suspect said drinking water as the source of disease, write to the Secretary of the State Board of Health, giving his reasons for such suspicion. Should they be satisfactory to the latter he will forward this permit either to said Superintendent, or such other physician as he may designate. The sample must be taken and packed by a *physician*, in strict accordance with the following directions:" Here follow specific directions for taking and shipping samples.

The counties have been assigned as follows:

DR. ANDERSON.

Alamance.
Beaufort.
Buncombe.
Burke.
Camden.
Carteret.
Caswell.
Chowan.
Craven.
Currituck.
Davidson.
Davie.

DR. PATE.

Alexander.
Alleghany.
Anson.
Ashe.
Bertie.
Bladen.
Brunswick.
Cabarrus.
Caldwell.
Catawba.
Chatham.
Cherokee.

Dr. Anderson.

Duplin.
Durham.
Edgecombe.
Gates.
Granville.
Greene.
Guilford.
Halifax.
Haywood.
Hertford.
Johnston.
Jones.
Lenoir.
Madison.
Martin.
Nash.
Onslow.
Orange.
Pamlico.
Pasquotank.
Pender.
Perquimans.
Person.
Pitt.
Rockingham.
Rowan.
Sampson.
Swain.
Tyrrell.
Wake.
Washington.
Watauga.
Wayne.
Wilson.

Dr. Pate.

Clay.
Cleveland.
Columbus.
Cumberland.
Dare.
Forsyth.
Franklin.
Gaston.
Graham.
Harnett.
Henderson.
Hyde.
Iredell.
Jackson.
Lincoln.
McDowell.
Macon.
Mecklenburg.
Mitchell.
Montgomery.
Moore.
New Hanover.
Northampton.
Polk.
Randolph.
Richmond.
Robeson.
Rutherford.
Stanly.
Stokes.
Surry.
Transylvania.
Union.
Vance.
Warren.
Wilkes.
Yadkin.
Yancey.

We would suggest to our medical readers to preserve this copy of the BULLETIN so that they can lay their hands on this information when needed.

DOES PURE WATER PAY?

The value of pure water cannot be expressed with absolute definiteness in dollars and cents, first, because we cannot say just how many lives and how much sickness it saves; and, second, because if these facts were known their value could not be told in money terms alone. But, while this is true, some figures can readily be presented by the engineer and sanitarian, which may have good effect when water supply or sewerage disposal problems are under discussion.

A good instance of what can be done in this line is presented by the following extract from a new book on "Water Supply," by Prof. Wm. B. Mason, of Rensselaer Polytechnic Institute, Troy, N. Y. Prof. Mason has made special studies of the relation between water supply and disease, both in this country and abroad. He writes under the caption, "Does Pure Water Pay?" as follows:

"To abandon an existing water supply system, or to purify the polluted water that it furnishes, always involves the outlay of much money, and the city taxpayer has the right to inquire whether or not the benefit derived is a fair equivalent for the cash expended. Impure water affects the yearly death rate, as a whole, much less than that section of it which deals with diseases recognized as 'water-borne,' prominent among which is typhoid fever. No better measure can be selected of the wholesomeness of a city supply than that furnished by a list of the annual cases of this serious disease.

"Typhoid fever is doubtless, to a very large extent, a preventable disease, but the means of prevention, in the shape of great public works, are expensive, and again the question is asked, Do these works pay? Can we afford to save the typhoid victims?

"According to Rochard:

"'The economic value of an individual is what he has cost his family, the community or the State for his living, development and education. It is the loan which the individual has made from the social capital in order to reach the age when he can restore it by his labor.

"'The statement of this value in the form of money is a difficult matter which has been variously settled by sundry investigators. Chadwick considers an English laborer equivalent to a permanent deposit of about $980. Farr gives about $780 as the average value of each human life in England. A French soldier is rated as worth about $1,200.'

"In view of the fact that typhoid fever selects by far the greatest number of its victims from among those in the very prime of life, to the relative exclusion of the very young and the very old, it will be reasonable to follow the figure fixed upon by E. F. Smith and place the loss caused the community by a death from typhoid at $2,000. This will be noticed to be less than half the figure so frequently referred to in the courts of this State, for the value of a human life.

"for the sake of illustration, let us consider the tax levied annually by typhoid fever upon a city of one hundred thousand inhabitants, for instance, Albany, N, Y. From statistics given in the five last annual reports of the State Board of Health, the deaths due to typhoid fever in Albany average 75 for the year. Rating the money value of each life at the figure given above, this death rate would mean an annual pecuniary loss to the city of $150,000. Funeral expenses are variously estimated at from $20 to $30. Should we accept the intermediate value of $25, this item would cause $1,875 to be added to the above sum, thus raising the total direct loss through death to $151,875.

"But typhoid fever does not always kill, its mortality rate is commonly quoted at about 10 per cent. For the present purpose, should we assume nine recoveries for each death from the disease, and place 43 days as the period of convalescence, (the average of 500 cases at the Pennsylvania Hospital,) we should have a term of 29,025 days as representing the time lost, per year, by the 675 persons who have the fever and recover. Thus an annual loss of over 79 years has to be borne by the city's capital of productive labor. This great amount of enforced idleness, when translated into money value, should very properly be added to the death loss above estimated.

"Fixing the rate of wages at $1 per individual per day, a very low figure, considering that the bulk of typhoid patients are in the very prime of life, there is a loss of $43 for wages for each recovery, or a total yearly loss for the city from this item of $29,025. The cost of nursing and doctors' bills equal at least $25 per case, which is a very low estimate, thus adding the further amount of $16,875 to the gross sum. Expressed in tabular form, this yearly tax imposed by typhoid fever upon the city of Albany is given below, and, upon a most conservative estimate, it is practically $200,000, which is $2 a year for each man, woman and child in the city, or a yearly tax of $10 for every family of 5 persons.

75 deaths at $2,000 each	$ 150,000
75 funerals at $25 each	1,875
Wages of 675 convalescents, during 43 days, at $1 per day.	29,025
Nursing and doctors' bills for 675 convalescents, at $25 each case	16,875
Total tax levied annually by typhoid fever upon the city of Albany	$ 197,775

"It can readily be seen that public works which could eliminate a reasonable fraction of this great tax would pay for themselves in the course of a few years, even though they were originally expensive.

"Finally, it is right to inquire what fraction of the present typhoid loss it would be reasonable to hope to save if pure water should be served in the city in place of its present polluted supply, To answer this question, recourse must be had to statistics obtained from other cities, covering periods before and after better water systems had been introduced. Such data have been already given for a number of cities and communities, and it only remains to anticipate what will be later said of Munich, and state that improved water and sewerage have reduced the annual typhoid mortality from an average of 25.4 per 100,000 to 2.7.

"Surely pure water pays in a city with such a record, and likewise it would pay in the newer but growing cities on this side of the Atlantic. Americans insist upon being supplied with much more water per capita than is usually furnished for Europe, but they are singularly indifferent as to its quality. It would be a reform of great moment if they could be induced to curtail the present enormous waste of public water, such as that of Buffalo, for instance, which is stated to be 70 per cent. of the entire pumpage, and to spend the money thus permitted to leak away in a vigorous effort to improve the quality of the water. No such lowering of the typhoid death rate as occurred in Munich, San Remo, and sundry other places, could be looked for, perhaps, but a large percentage of the present rate could be cut off, and, we think, from a consideration of the above figures, that such a reduction would pay.

"No weight should be attached to the argument, so often advanced by the individual householder, that he and his family have used the water without evil results for the past fifty years. A single family is too small a collection of units upon which to base any estimate touching the question at issue. Placing the typhoid death rate for Albany, as above, at 75 annually, it would call for one death in a family of five persons every 261 years, a period much beyond the limit of ordinary family record."

THE PROPOSED HEALTH CONFERENCE AT CHARLOTTE.

On the 15th of October there will be held at Charlotte the third annual "Health Conference with the People." Our readers are already familiar with the methods observed in these meetings, that they are essentially popular in character, the object in view being to interest and instruct the people in sanitary matters. Papers of a practical character are read and discussed by members of the Board of Health and persons in the audience. In addition the people are urged to ask questions on any subject relating to hygiene, and they are answered by members of the Board or others who are competent.

The meeting at Charlotte promises to be an interesting one, and valuable to that community particularly, but indirectly to the State. Those previously held at Salisbury and Washington have, we have been assured, done much to advance the cause of sanitation in those communities. We trust that the citizens of that progressive city will show in this, the most important of all mundane matters, health, the same interest that they are wont to display in other movements looking to the welfare and upbuilding of their city. But we hope that the attendance will not be limited to residents of the city. Charlotte is such a railroad centre that persons from neighboring counties could easily attend. We believe that they would be repaid for their trouble. It is especially desirable that all Superintendents of Health, as well as other health officers and physicians generally, within reach, should put in an appearance. They are all not only invited but are requested to get as many of their people as possible to attend.

There will be three sessions during the one day, morning, afternoon and night. A number of papers have been promised, and Surgeon J. J. Kinyoun, the distinguished bacteriologist, in charge of the laboratory of the Marine Hospital Service at Washington, will deliver at night an address on "Bacteria," illustrated with the stereopticon. Several days before the meeting the full programme will be published in the Charlotte papers and otherwise distributed.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

We have just returned from the 24th annual meeting of the above-named association, held at Buffalo, N. Y., 15th to 18th insts. and feel that we would not be treating our readers fairly if we failed to bring to their attention at least one or two matters of great importance and interest that were brought up and discussed. We wish that our space permitted a more extended notice, as the meeting was the most interesting and practically valuable that we have ever attended. Of course much old straw was threshed over, but nevertheless a good crop of solid grain was harvested.

The subjects alluded to above were a new (to us) method of making a diagnosis in typhoid fever and formaldehyd gas as a disinfectant. On the former subject a paper entitled "The Serum Diagnosis Test for Typhoid Fever" was read by Dr. Wyatt Johnston, of Montreal, Bacteriologist to the Provincial Board of Health of Quebec. The test, discovered by Widal, consisted in mixing the serum of the blood of a suspected case of typhoid fever, which he obtained by bleeding from the arm and used fresh, with a pure culture of typhoid bacilli. If the case were typhoid the bacilli, which normally keep up a constant and rapid motion, would, in from 15 minutes to an hour, become agglutinated to one another and still, whereas, if the disease were not typhoid, their movements would not be interfered with in the least. Dr. Johnston stated that he had ascertained that it was not at all necessary to draw enough blood to allow separation of the pure serum from the clot, but that a drop of dried blood with which a little water was mixed would answer just as well, having precisely the same effect. He exhibited two specimens which confirmed his statements exactly: and although the bacilli had been mixed with normal blood more than 24 hours, they were still quite active. The beauty of this test is its simplicity, and it can be made by any one having a good microscope, slides for the "hanging drop" mounting, and a pure culture of the bacillus typhosus, which could no doubt be obtained from the commercial laboratories.

The subject Formaldehyd was treated in three papers: "Practical Use of Formic Aldehyde as a Disinfectant," by Prof. F. C. Robinson, Professor of Chemistry in Bowdoin College and Member of the State Board of Health of Maine; "Preliminary Note on the Use of Formaldehyd for Room and Car Disinfection, etc.," by Surgeon J. J. Kinyoun, M. H. S.; and "A Convenient Lamp for Generating Formaldehyd Gas," by E. A. DeSchweinitz, M. D., Ph. D., of the National Bureau of Animal Industry. Nothing could be of more importance or interest to practical sanitarians, for nothing is so much desired by them as a safe and reliable aerial disinfectant, and we could not but feel gratified at the fact that two of the three gentlemen reporting work on this subject—the last two—were natives of our own State. We regret that we cannot go into the subject at length, but must content ourself with stating very briefly some of the results given.

Prof. Robinson said that he had thoroughly disinfected a room 12x20x13 feet in one hour's time by burning one litre (about a quart) of wood alcohol in a lamp of his own construction which he exhibited, killing cultures of bacteria under the bed-clothes, in a mattress (not inside the ticking) rolled around them, and under ½ inch of sand. Dr. Kinyoun, who has been experimenting with the gas for several months, stated that air saturated with Formaldehyd killed germs in from 1½ to 2 minutes. Exposure to 1¼ % of the gas for 24 hours resulted in the death of germs protected by 10 to 12 layers of blanket, and also to those covered by from 36 to 40 layers of cotton sheeting. By using a 10 to 20 % solution in Roux's apparatus a room could be disinfected in 20 minutes. He found that none of the car-furnishings were faded, except two pieces of silk. The bacilli most easily killed were those of diphtheria, and the next weakest were the tubercle bacilli. We shall recur to this important subject in a future issue.

In conclusion we wish to express our appreciation of the beauty of the city of Buffalo, not only from the æsthetic point of view, with its handsome buildings, lovely parks and beautifully shaded asphalt streets, of which it has nearly two hundred miles, but also from the sanitary, for it is decidedly the *cleanest* city we have ever visited. We also desire to acknowledge the kindness and hospitality extended to us through Dr. Wende, the most efficient Commissioner of Health, Dr. Lucien Howe, Dr. Clark and others of the local committee.

DR. JEROME COCHRAN.

It is with much regret that we note the death, since we last went to press, of Dr. Jerome Cochran, for many years State Health Officer of Alabama. Dr. Cochran was a gentleman of acute and cultivated intellect, of high repute in his profession. He was a leading authority in this country on the subject of yellow fever, having had a very extensive experience with that dread disease. He will be greatly missed in the profession at large, but particularly in the field of preventive medicine, to which he devoted the later years of his life.

REPORT OF TREASURER.

FOR TWO YEARS ENDING DECEMBER 31, 1896.

1895.		*Expenditures.*	
Jan.	12	500 postal cards for notices to Superintendents.	$ 5 00
	22	Stamps	10 00
Feb.	1	Salary of Secretary for January	83 33
	5	F. P. Venable, per diem and expenses for called meeting at Raleigh January 29	15 00
	7	Wax paper for duplicating purposes	36
		George G. Thomas, per diem and expenses for Raleigh meeting	18 45
	9	Postage, supplies to Superintendents	66
	14	W. H. Harrell, per diem and expenses for Raleigh meeting	22 90
	16	Postage, December and January Bulletins	1 31
Mar.	2	Salary of Secretary for February	83 33
		1 ream typewriter paper	1 00
	9	Express on microscope to Rochester, N. Y	1 90
		Postage on Bulletin, February	64
	23	Paid for typewriting and manifolding circular letters	1 50
	28	Six-cent stamps for mailing Biennial Report	10 00
April	1	Office rent, first quarter	15 00
		Salary of Secretary for March	83 34
		Two-cent stamps for general postage	10 00

11	Stamps for Health pamphlets	$	20	00
15	Express on microscope from Rochester, N. Y.		2	00
23	Postage for health pamphlets		20	00
24	Postage, Bulletin for March			64
	Express on six packages health pamphlets		2	51
	Bausch & Lamb for repairs to microscope		10	00
April 29	1 copy of Postal Guide		2	50
30	Express, health pamphlets		18	94
May 3	Postage, health pamphlets		15	00
4	Express, health pamphlets			70
7	Postage, health pamphlets		20	00
	Salary of Secretary for April		83	33
8	Express, health pamphlets		2	02
18	Express, health pamphlets		3	05
23	Postage, health pamphlets		20	00
29	F. P. Venable, per diem and expenses, annual meeting at Goldsboro on 15th instant		20	15
	G. G. Thomas, per diem and expenses, annual meeting		11	00
June 1	Salary of Secretary for May		83	33
	Allowance for clerical help		16	67
4	Express, health pamphlets		3	15
11	Typewriter ribbon, mucilage, twine, etc		2	42
13	Postage, Bulletin for April			65
22	Drayage, health pamphlets			15
24	Postage, health pamphlets		20	00
July 1	W. H. Harrell, per diem and expenses, annual meeting		27	25
	Express, health pamphlets		4	05
	1 copy American Text-Book of Medicine for Secretary's office		10	00
3	Salary of Secretary for June		83	34
	Clerical help for June		16	66
	Office rent, second quarter		15	00
4	500 postal cards		5	00
	Drayage, Bulletin and health pamphlets			20
6	Drayage, Bulletin and Health pamphlets			25
	Bacteriological examination of water of cistern at Governor's Mansion and express on sample		10	50
9	Books on hygiene for Secretary's office		4	32
12	Drayage, health pamphlets			25
13	Postage, Bulletin for May			63
30	Postage, health pamphlets		20	00
	Drayage, health pamphlets			10
	Freight, health pamphlets			25

Aug.	1	Express on health pamphlets	$ 80
		Telegram	25
	4	Salary of Secretary for July	83 33
		Clerical help for July	16 67
	7	Postage, health pamphlets	20 00
Aug.	16	1,500 1-cent stamps for notices of meeting of County Boards of Health	15 00
	27	Postage, health pamphlets	20 00
	28	Postage, Bulletin, June	64
	29	Drayage and freight, health pamphlets	1 36
Sept.	3	Large wrappers for packages of health pamphlets	1 75
	3	Postage	50
	3	Salary of Secretary for August	83 33
	3	Clerical help for August	16 67
	3	Dr. Albert Anderson, bacteriological examination of suspected drinking water from Asheville	10 00
	4	Express, 14 packages health pamphlets	5 62
	4	Postage, health pamphlets	50 00
	5	Postage on Bulletin, July and August	1 29
	19	Postage, health pamphlets and supplies to Superintendents	35 00
	24	Drayage, health pamphlets and supplies to Superintendents	25
	26	Postage, health pamphlets	20 00
Oct.	2	Express, health pamphlets	60
	3	Postage, health pamphlets	10 00
	5	Salary of Secretary for September	83 34
	5	Clerical help for September	16 66
	5	Drayage, 3 loads health pamphlets	60
	15	Expenses of Secretary to annual meeting of the American Public Health Association, Denver, Col., 4th inst	124 85
	17	Postage, health pamphlets	20 00
	21	S. W. Battle, expenses attending American Public Health Association	118 00
	24	Postage on Bulletin, September	69
	30	J. C. Chase, per diem and expenses inspection of State Normal and Industrial School	18 70
	30	Subscription to *Engineering Record* for Engineer of the Board	5 00
Nov.	1	Large wrappers for packages of health pamphlets	1 50
	1	Salary of Secretary for October	83 33

	1	Clerical help for October	$	16 67
	1	Office rent, 3d quarter		15 00
	12	F. P. Venable, per diem and expenses, Health Conference at Washington, 6th inst		27 10
Nov.	16	Express, health pamphlets		1 95
	28	J. C. Chase, per diem and expenses, Washington Health Conference		28 95
	28	J. C. Chase, 1 day's per diem, work for Normal and Industrial School		4 00
	28	1,000 wooden tongue depressors for Public Schools		1 00
	30	Miss Daisy Branson, list of lawyers in 34 counties		1 50
Dec.	2	Express, 4 packages health pamphlets		1 65
	2	Stamps		2 00
	2	Salary of Secretary for November		83 33
	2	Clerical help for November		16 67
	3	Telegrams		85
	12	W. H. Harrell, per diem and expenses, Washington Health Conference		6 00
	12	R. H. Lewis, expenses, Washington Health Conference		12 70
	12	Postage on Bulletin, October and November		1 26
	14	Express on 1,000 wooden tongue depressors		65
	19	Postage, health pamphlets and general purposes		20 00
	21	J. W. Hinsdale, type-written list of all lawyers in the State		2 50
	31	Salary of Secretary for December		83 34
	31	Clerical help for December		16 66
	31	Office rent, 4th quarter		15 00
1896				
Jan.	2	Express, supplies to two Superintendents		55
	28	Stamps		5 00
Feb.	1	Subscription to 8 copies *Sanitarian* for members of the Board		28 00
	1	Salary of Secretary for January		83 33
	1	Clerical help for January		16 67
	8	Postage on Bulletin, December and January		1 44
	8	Drayage		10
March	2	Salary of Secretary for February		83 33
	2	Clerical help for February		16 67
	4	500 postal cards		5 00
	6	Postage on Bulletin, February		70

	7	Express, 2 packages supplies to Superintendents	$ 60
April	1	Salary of Secretary for March	83 34
	1	Clerical help for March	16 66
April	1	Office rent, first quarter	15 00
	1	Express, health pamphlets	80
	14	Postage on Bulletin, March	68
	28	500 postal cards	5 00
May	1	Drayage, Bulletin	10
	2	Express, 7 packages reports members of Board	2 01
	2	Salary of Secretary for April	83 33
	2	Clerical help for April	16 67
	5	Postage on Bulletin, April	69
	9	G. G. Thomas, per diem and expenses, inspection Johnston County jail	19 45
	9	R. H. Lewis, expenses on same account	2 50
	9	Sundry accumulated small items	13 02
	22	G. G. Thomas, per diem and expenses, annual meeting at Winston	24 45
	22	F. P. Venable, per diem and expenses, annual meeting at Winston	16 85
	22	W. J. Lumsden, per diem and expenses, annual meeting at Winston	44 60
	22	R. H. Lewis, expenses, annual meeting at Winston	8 05
June	1	Salary of Secretary for May	83 33
	1	Clerical help for May	16 67
	16	G. G. Thomas, expenses to National Conference of State Boards of Health at Chicago June 10th	85 15
	16	Expenses of Secretary to same	79 25
	18	Dr. W. T. Pate, two bacteriological examinations of suspected water from Wilmington	20 00
July	1	Salary of Secretary for June	83 34
	1	Clerical help for June	16 66
	1	Office rent, second quarter	15 00
	3	1 copy transactions, section State Medicine, American Medical Association	1 00
	6	Drayage, health pamphlets	25
	6	Stamps	10 00
	9	Drayage, 5 loads health pamphlets	1 00
	10	Postage on Bulletin, May	66
	12	Drayage, health pamphlets	25
	16	W. H. Howell, per diem and expenses, annual meeting	29 00

Aug.	4	Salary of Secretary for July	$ 83 33
	4	Clerical help for July	16 67
	20	Postage on Bulletin, June and July	1 32
	20	C. O. Probst, treasurer, dues of the Board to the National Conference of State Boards of Health for two years	25 00
	22	1 copy North Carolina Directory	5 00
Sept.	1	Salary of Secretary for August	83 33
	1	Clerical help for August	16 67
	24	Subscription to Engineering Record for the engineer of the Board	4 00
	29	Expenses of the Secretary to annual meeting of American Public Health Association at Buffalo, N. Y., 15th–19th	65 33
Oct.	1	Office rent, third quarter	15 00
	1	Salary of Secretary for September	83 34
	1	Clerical help for September	16 66
	8	Dr. Albert Anderson, nine bacteriological examinations of municipal water supplies	90 00
	8	Express on samples of same from the various towns	5 35
	12	Stamps	10 00
	13	Express, health pamphlets	50
	20	Stenographer at Charlotte Health Conference	3 00
	23	Expenses of Secretary, Health Conference at Charlotte and inspection of State Hospital and Deaf and Dumb School at Morganton	23 50
	23	Express on stereopticon and apparatus for illustrated lecture on bacteria at Charlotte Health Conference	4 55
	23	Postage on Bulletin, August and September	1 34
	27	G. G. Thomas, per diem and expenses, Health Conference and inspection State Hospital and Deaf and Dumb School	47 35
	27	F. P. Venable, per diem and expenses, Health Conference and inspection State institutions at Raleigh	38 38
	28	W. J. Lumsden, expenses as delegate to American Public Health Association meeting at Buffalo	43 84
	28	W. J. Lumsden, per diem and expenses, Health Conference	51 85
Nov.	2	Salary of Secretary for October	83 33
	2	Clerical help for October	16 67
	9	Sundry telegrams	1 35

	13	Postage on Bulletin, October	$ 67
	19	W. P. Beall, per diem and expenses, annual meeting, Health Conference at Charlotte and inspection of State institutions at Greensboro	25 00
Dec.	2	Scissors for Secretary's office	85
	2	Dr. W. T. Pate, nine bacteriological examination of municipal water supplies, express charges on samples of same and expenses of trip to Fayetteville to obtain proper sample	100 80
	2	Salary of Secretary for November	83 33
	2	Clerical help for November	16 67
	14	Postage on Bulletin, November	67
	15	Stamps	3 00
			$ 4,268 04

RECEIPTS.

Balance on hand January 1, 1895	$ 265 46
Appropriation for year 1895	2,000 00
Appropriation for year 1896	2,000 00
Amount advanced by Treasurer	2 58
	$ 4,268 04

APPENDIX.

HEALTH CONFERENCES WITH THE PEOPLE.

The plan of having, at least annually, a meeting with the people to discuss with them the questions appertaining to the public health, inaugurated in September, 1894, at Salisbury—a report of which meeting was given somewhat *in extenso* in the appendix to the last Biennial Report—has been continued. One conference has been held each year, on November 6, 1895, with the people of Washington, in the eastern part of the State, and on October 15, 1896, with the people of Charlotte, in the Piedmont country. These meetings excited considerable interest in the respective communities where they were held, particularly in Washington. They have unquestionably been helpful in educating public opinion in the value and importance of sanitation.

We give below a list of the papers read.

AT WASHINGTON.

Impurities in Drinking Water—by Prof. F. P. Venable, of the University, member of the Board.

How We Catch Cold and the Best Way to Prevent It—by Dr. S. Westray Battle, U. S. N., of Asheville, member of the Board.

Sanitary Drainage and Disposal of Household Wastes—by Mr. John C. Chase, of Wilmington, Engineer of the Board.

Malarial Diseases in Eastern Carolina—by Dr. Julian M. Baker, of Tarboro.

Preventive Medicine—by Dr. John C. Rodman, of Washington.

Remarks on That Part of Hygiene which concerns the Physician—by David T. Tayloe, M. D., of Washington.

AT CHARLOTTE.

The Board of Health and the Public, Their Reciprocal Relations—by Dr. Geo. Gillett Thomas, of Wilmington, President of the Board.

The Cause and Prevention of Certain Diseases—by Dr. John Whitehead, of Salisbury, member of the Board.

Drinking Water and Typhoid Fever—by Prof. F. P. Venable, Ph. D., of the University, member of the Board.

Purification of Public Water Supplies—by Mr. John C. Chase, of Wilmington, Engineer of the Board.

Effects of Alcohol on the Human System—by Dr. S. Westray Battle, U. S. N., of Asheville, member of the Board.

The Insane Population of North Carolina—Can the State Care for Them?—by Dr. P. L. Murphy, Superintendent of the State Hospital at Morganton.

Bacteria: Illustrated with the Stereopticon—by Passed Assistant Surgeon J. J. Kinyoun, U. S. Marine Hospital Service, Washington.

Infectiousness of Milk—by Dr. Richard H. Lewis, of Raleigh, Secretary of the Board.

General discussion, the audience often taking part, of the subjects brought forward by the papers, and of other subjects suggested by questions by individuals in the audience, completed the proceedings.

Some of the papers of a specific as contra-distinguished from those of a more general character, follow:

SANITARY DRAINAGE AND THE DISPOSAL OF HOUSEHOLD WASTES.

BY J. C. CHASE, OF WILMINGTON, ENGINEER OF THE BOARD.

(Read at Washington Health Conference.)

The necessity of thoroughly draining town-sites can hardly be over-estimated. It is so generally admitted that any argument to that effect would seem to be superfluous. Unfortunately, however, the masses do not need argument so much, as having their attention aroused to the danger of their unhealthful surroundings and unsanitary mode of living.

"Familiarity breeds contempt" and the average citizen will apathetically continue to endure his present ills instead of exerting himself to secure an improved condition of affairs. The dangers to health and life conditioned upon dwelling in the low, swampy sections of our State are so well known that they need not be dwelt upon. The advantage to public health gained by draining these swamps and putting them under cultivation is also a well-established fact, and a noteworthy illustration may be found at the convict camp at Caledonia.

The rapid and thorough removal of surface water should be the first great care in the carrying out of city sanitation. All lots should be so graded that falling water will run off with the greatest facility, and under no circumstances should pools of stagnant water be allowed to remain under dwellings. Pure water, under such conditions, would be bad enough, but when we consider that these pools are more than likely to be a decoction of the filth that too often accumulates about the average household, the prospect is far from inviting. I hope that such conditions are not common in the city we now have the pleasure of visiting.

Stagnant surface water is not alone the cause of the many ills that may be traced to an excess of moisture in our surroundings. The close proximity of the ground water to the surface is nearly, if not fully, as detrimental to health, and its removal from the vicinity of habitations should be the first care, when the establishment of a home is under consideration.

Unfortunately, in the building of cities, due regard is not paid to the question of drainage. As is well known, cities are a growth, which, too often, takes no thought for the future, considering, if any consideration is given to the matter, that the future can take care of itself. It is hardly possible to conceive of a more foolish idea.

The result is that, eventually, we find that our city contains numerous basins of entrapped water, that could have been easily disposed of, if a wise forethought had been exercised in the matter of surface grading, before the lots had been covered with habitations.

The first care then in beginning the sanitary improvement of that type of city, which we may style an overgrown village, will be to perfect its surface drainage. The streets should be so constructed that the water will flow quickly into gutters that will carry it beyond the confines of the city. These gutters should have such a slope and be kept in such a cleanly condition that the water will not have a chance to remain in pools to stagnate and putrefy.

In a city having the light grades that are the rule in those in this section of the State, the desired results can only be secured by vigilance exercised to, perhaps, a greater degree than we can hope for in the present state of popular opinion.

It goes without saying that all house lots should be raised to a grade that will permit of their surface drainage passing into the street gutter, if possible, or, failing in that, some system of underground drainage should be provided that will discharge at an elevation that will produce the desired effect.

This much for surface drainage. Now we can go a step farther and say that in the interest of healthy homes we should permanently lower the ground water near habitations to at least five or six feet below the surface. A soil thoroughly saturated with water is little, if any, more satisfactory as a local condition than dwelling over an actual water surface.

In a porous, gravelly or sandy soil this danger is reduced to a minimum, but in the compact clayey soils of certain sections a thorough system of underground drainage is the only sure way of remedying the difficulty.

It is too much to expect that this city, for instance, will embark in such a scheme, and the only chance of improving the local conditions would seem to be by paying due regard to securing effectual surface drainage, so that in due time the ground water level would be lowered, to some extent, by seepage into the lower strata. The slight elevation of the general surface of the city above the water level of the river does not afford much encouragement for any material lowering of the ground water level.

Frequently in the location of cities no regard is paid to the proximity of creeks or swamps that in due time are found to be unpleasant neighbors, to say the least, if not actually detrimental to health.

If the city does not find it practicable to move, the question of abating the nuisance becomes a live one. If, as is often the case, the swampy territory cannot be thoroughly drained and turned into habitable territory, a deep channel can be dredged which will give a clear and unobstructed waterway and aid very materially in reducing the quantity of stagnant water. The material removed can be used to raise the grade of the adjacent territory, the banks of the ditch or canal being protected by bulkheads, if necessary.

The disposal of household wastes is a serious question for the average householder, for on the satisfactory solution of this problem depends much of his comfort, convenience and happiness. For a certain class of the wastes, more particularly the liquid ones, water carriage by means of a sewerage system is by far the best method, assuming that the system is properly and thoroughly constructed, and that the disposal of the effluent is accomplished in a satisfactory manner. There is a large amount of refuse, however, that it is impossible to remove by the means of sewers; we also have aggregations of houses that do not enjoy the advantage of sewer connections, and it is a serious question to devise for such cases satisfactory methods of disposal.

This paper is intended primarily for the benefit of those residing in our smaller cities and towns, who do not enjoy the advantages of a sewerage system, or the regular and systematic collection of garbage.

The first device resorted to is what is known as a "cess-pool" or "dry-well," into which the wastes from the kitchen sink, bath tubs and water closets are discharged, and out of which the liquid components are supposed to leach into the surrounding earth. If the earth is reasonably porous and the use of water is not excessive such receptacles will serve the desired purpose for a term of years, but sooner or later the pores of the earth will become clogged with filth and the receptacle will fill up and require that its contents be removed from time to time.

This method of disposal is generally regarded by sanitarians as highly objectionable and to be tolerated only when absolutely no other way is practicable. The danger to the health of a household by the putrefying gases from such a collection of filth finding access to the dwelling by means of defective plumbing can scarcely be overestimated. In its best estate this device should only be tolerated, and in its worst prohibited as verging on a danger that is little short of criminal. Cess pools should be absolutely forbidden in towns and villages obtaining their water supply from wells.

Country houses and those situated on large lots in villages can very often dispose of their sewage by permitting it to run out on the surface of a grassy or cultivated slope, care being taken that the quantity discharged in one spot is not large enough to create a stagnant pool.

If a ditch from the end of the outlet is so constructed as to uniformly distribute the daily flow over a fair-sized area, the sunlight, air and vegetation will keep the locality practically innocuous.

In this climate I know of no better way to dispose of the liquid wastes of a household, where a sewerage system is not available than by throwing them out on the soil, at a proper distance (not less than 100 feet from any well or spring and on a lower level) from the dwelling. Care should be taken not to concentrate the quantity in any one spot, and if thrown upon grass ground, which is preferable, any heated water should be allowed to stand until it is cooled. If not thrown upon grass ground the soil should be stirred up from time to time to prevent its becoming hardened with an impervious coating of filth which would detract very seriously from its absorbing power.

This method is virtually the intermittent system of filtration which has given such excellent results in the purification of water and sewage. The area required for handling the wastes of an ordinary household is insignificant.

For ordinary kitchen refuse, generally known as "garbage," the most satisfactory method of disposal is by burning or burial, except where a systematic and regular collection of it is made by the municipal authorities; and even then the average householder can very often take care of his own wastes more efficiently than by leaving the work to be done by the average city department with the usual inefficiency and delays. In the interest of cleanliness, decency and health, accumulations of this sort should not be allowed to exist.

The most effectual way of disposal is by burning, and the kitchen stove can be used to good advantage for that purpose. The principal difficulty will be the large amount of moisture that will naturally be found in such stuff, which will deaden, if not put out, the fire should an attempt be made to burn it in its ordinary condition. Several devices have been put on the market designed for the purpose of drying the refuse before any attempt is made to consume it. The most successful is one designed by Dr. S. H. Durgin, Chairman of the Boston Board of Health. It is merely a metal basket that is inserted into the stove-pipe. After the charge has been sufficiently dried it is emptied into the fire, where it is readily consumed.

While cremation is without doubt the *best* method of destruction for all kitchen refuse, it is perhaps too much to expect its general use by the majority of householders. It will, however, be of great service in buildings occupied by several families, which have limited or no yard privileges.

In our small cities and villages, where isolated houses are the rule, and the lots are sufficiently large, this refuse can be incorporated into a compost heap without any unpleasant or unhealthful results, or buried outright. If burial is resorted to, a shallow trench can be dug, and as each day's deposit is made, the adjacent earth thrown over it, thus making the excavation for future deposits.

The care of the ordinary privy and disposal of its contents as the occasion arises is one of the most troublesome questions in household sanitation. Although sanctioned by custom from time immemorial, I regard the common tight brick vault as an unmitigated nuisance. The ordinary practice of retaining a mass of semi-fluid filth for several years, as is often the case, in close proximity to dwellings, cannot be too strongly condemned. It is perhaps too much to expect that we can bring about the use of the "pail system," where a limed bucket would be used as a receptacle for the excreta, the contents being removed each day, and buried, the bucket being recoated with lime before replacing it.

For the class of homes we have under consideration, I can conceive of no better way than to have the privy entirely above ground, without any receptacle for the excreta, other than a slight depression in the earth. The excreta should be at once covered with a suitable quantity of dry earth or ashes, which would absorb any liquids and render the whole mass virtually innocuous. A receptacle for the covering material should be kept in the privy, and replenished as often as it may become necessary. The accumulation should be removed weekly and buried, or used for fertilizing purposes.

This method would naturally prevent using the privy as a receptacle for the ordinary liquid wastes of the household, as is frequently the case, but these can be easily disposed of by a general distribution on the soil, as has been previously outlined.

Where the municipality takes upon itself the removal of the garbage and night-soil. the householder may experience a certain amount of relief from the onerous duty of personally attending to these duties, but I venture the assertion that he will probably secure better results by continuing to be his own scavenger. In any event he will realize that it is only by perpetual vigilance that a semblance of cleanliness can be maintained in this respect.

I have thus endeavored, in a brief and informal manner, to present a few ideas on the various branches of the topics under consideration, which, it is hoped, will tend to create a stronger public sentiment in favor of more healthful environments for the great mass of our citizens.

These views are not dogmatically presented as the only way of accomplishing the desired results, but rather as indicating some of the methods that can be used to aid in making our homes cleanly and comfortable, fully believing that where cleanliness, comfort and convenience abound good health is not far distant.

It is not considered out of place in conclusion to bear testimony to the important power that can be wielded by the mistress of the household in the line of securing proper sanitation. We hear a great deal in these days of the "New Woman," whatever the term may mean. If she comes educated and trained to uphold the hands of the physician and sanitarian, her coming, whether on bicycle or in bloomers, will be heartily welcomed, and she will receive the honor and praise that, it is hoped, will eventually come to all those who devote their lives to ameliorating the condition of a large portion of the human race.

IMPURITIES IN DRINKING WATER.

BY F. P. VENABLE, PH. D., PROFESSOR OF CHEMISTRY IN THE STATE UNIVERSITY.

(Read at Washington Health Conference.)

The purity of the water supply is a question arousing a very anxious interest at present in the various ommunities of this and other States. And it is fully time that all were waking up to the extreme importance of the question. Next to the air we breathe, the freedom of the water we drink from all that endangers health should give us most concern.

It is right and proper that we should object to having our sugar mixed with barite, parched beans sold us for coffee, and sulphuric acid for vinegar. Such adulterations as these are often dangerous and justly arouse our indignation because of the fraud and wrong connected with them. But none of them approach in insidious threat against health the pollution of that every-day necessity, our drinking water.

It being granted, then, that pure water is a necessity, the anxious citizen is inquiring how he shall decide as to this purity, by what tests he may detect pollution, and it is my object to day to clear away, if possible, the technical mists, and make this matter of water analysis a little clearer to the average water consumer.

I propose to divide the subject up as follows:

1. The Sources of Supply.
2. The Cause of Contamination or Pollution.
3. The Nature of the Impurities Most Commonly Met With.
4. The Tests or Methods of Analysis.

THE SOURCES OF SUPPLY.

According to location, our drinking water is drawn from springs, streams, wells, or stored up rainfall water.

In the case of springs, we have usually a very excellent but a very inadequate source of supply. It does not often happen that the spring gushing out at the foot of some hill yields a supply more than sufficient for one or two neighboring farm houses. For our purposes, then, it need scarcely be mentioned except as a possible source. It should be stated, however, that though often very pure all spring water is not above suspicion. Water coming from a hill, the sides of which are polluted, must almost of necessity be polluted itself. I have in mind now a large spring, which formed part of the supply of a certain town outside this State. On the hillside was the very populous cemetery. It goes without saying that the water of that spring was quite unfit for drinking, and caused much sickness wherever used. Often in the country we find the farm house and all the out-buildings placed upon the hillside, and drained right into the spring which furnishes the water of the place.

In many towns in this State the most available source of supply is some country stream. These are unfortunately generally small. I say unfortunately, because the smaller streams have less chance for self-purification than the larger ones, as the dilution is less. They are subject to a great many sources of pollution, and can only be considered safe when the community owns and carefully guards the entire water-shed. One case of typhoid fever in a farm house bordering the stream, or built upon an overhanging hill and so draining into it, could easily communicate the disease to hundreds of people.

The stables and outhouses of these farms are frequently placed upon the banks of a smaller branch, which thus has the filth of man and beast thrown into it, carries it down to the large stream and contaminates the whole.

But the chief supply of most of our towns, villages and scattered houses is in the wells, and therein lies the great danger. Not that well water may not be pure, but in most crowded communities it stands very little chance of retaining whatever may have been its original purity. Each well acts as a drain for the immediately surrounding neighborhood. The amount of surface drained depends, of course, upon the nature of the soil. It is surprising how great an extent of surface is drained by a deep well in a loose porus soil. Some experiments carried out at Memphis and elsewhere show that a deep well can be contaminated by filth more than a quarter of a mile distant. Often the filth of many years has accumulated upon and for a foot or more down in this soil, and the seepage of the rain and other water must of necessity carry it on down into the well. Knowing the impossibility of cleaning this surface, or of keeping it clean as the population increases, sanitarians, as a rule, look with disfavor upon wells as a reliance for the drinking waters of thickly settled communities. There is no method known of purifying such a soil, and no safety in the use of the wells after it has once become infiltrated with decomposing organic matter. It is an error to think that the mere cleaning out of a well contaminated in this way can materially aid in its purification. Cleaning out removes the body of polluted water already standing in it, only to make room for the inflow of that freshly polluted. Many have the idea that the abundant use of the water, lowering the level, bringing in fresh, preventing stagnation and splashing down a supply of fresh air are all aids to the purification, but it is manifest that these are methods quite inadequate to deal with the water filtering down through the mass of garbage, offal and poisoned earth.

This question of the use of wells is one that sanitarians have to deal with everywhere. Even in large towns with abundant supply of pure water, it is found impossible to make all discard the use of the wells their fathers dug. I know of a town in Virginia where clear, pure mountain water is supplied by the municipal authorities. Still many use the old wells. In the first three years after the introduction of this water supply there were sixty-three cases of typhoid fever, sixty of which were among those who used the well water. I might strengthen the ground I take with regard to the average well by giving you the analyses of water drawn from the famous well of Mecca and from certain old wells of Spain. Suffice it to say that these were found to be literally liquid sewage. And the commission sent to examine into the condition of Havana, with a view to combating the yellow fever scourge in its home, found the soil of that fever-ridden city for several inches down simply a mass of festering filth. Now I will admit that some of this filth can be kept out by sinking a narrow, deep well and thoroughly lining it with iron tubing. Such a mode of procedure forces the water to go through a greater depth of soil before it can enter the well, or draws its supply from the deep subterranean waters, cutting off that which we call the surface water. This method can often be of great use, as has been shown in the eastern section of our State. But that it would be a safe remedy everywhere is disproven by the experience in New York city. Some very deep wells have been sunk there, really corresponding to artesian wells. They have pierced through the upper strata of loose soil, rock and clays to a depth of several hundred feet, and found there pockets or reservoirs filled with the city's sewerage, which has soaked through to that and perhaps even greater depths. There is little or no chance for self-purification on the part of the water which has thus sunk below the level at which it can obtain fresh supplies of oxygen.

As to the last source of supply—the use of cisterns, tanks, and other storage reservoirs for rain water—I may say that the chance for pollution is three-fold. First, the impurities washed out of the air. This in crowded cities and in times of epidemics may be a dangerous source of pollution. Secondly, many impurities are washed down from the roofs on which the water is collected. Third, it has been found that the various cements used are not impervious to water, and that polluted water leaking from some near sewer can pass through the walls of an underground cistern, and so contaminate the whole.

We have now gone over the different sources from which we draw our drinking water, and have seen how easily it can become polluted, in fact, how difficult it is to prevent this pollution, and how carefully we must watch and guard against it. It will be well next to look into the nature of these impurities and to form some idea as to their relative danger.

It is well for me to remark, first, that perfectly pure water is never seen, and is not desirable. If I were to prepare for you a goblet of chemically pure water, and I can assure you that it would cost me much time and labor to do this, you would probably content yourselves with the merest sip, and reject the rest as being insipid or distasteful. The natural pure water of which we have been speaking contains certain impurities found in all waters, and hence we call these impurities normal impurities. These include certain gases gotten out of the atmosphere or soil, as oxygen, nitrogen and carbonic acid, and a few others in smaller amounts; then from the soil a number of mineral substances are taken up. These are usually in small amounts, and are the very same ones which are utilized in the animal organism. If these are present in excessive or abnormal amounts they act medicinally, and the water is called a mineral water. Of course these mineral waters often contain abnormal constituents, such as alum, lithia, etc., not ordinarily present in drinking water. Perfectly pure water is insipid to us because we have become accustomed to the taste of these minerals and gases, and notice immediately the lack of flavor caused by their absence.

The more dangerous impurities are those of vegetable or animal origin, and these again may be dead and undergoing the changes caused by decay or fermentation, or they may be living. The decaying organic substances are usually present in quantities too small, even in very impure waters, to be directly dangerous themselves. The danger from them lies rather in the fact that they afford, during their decay, an excellent feeding ground or nutritious medium for the growth and multiplication of the living vegetable matter, or, as we have grown accustomed to call them, the bacteria. The portion of the vegetable or animal matter which is especially necessary for the growth of these bacteria is that containing nitrogen, as the bacteria are themselves nitrogenous. This nitrogenous matter, during the decay, changes into either ammonia or nitric acid. The portion of the plant or animal which mainly yields this nitrogen is that which we call albuminoid, and is similar in nature to the white of eggs or the lean muscular part of the meat. Now, let it be distinctly understood that it is not maintained that the greatly diluted solution of these substances which we would get in an ordinarily impure well water is, of itself, a source of disease. It would greatly disgust us to know that we were drinking such stuff, but we might unconsciously partake of it and never know it. Some may recall the experiment of the famous, or infamous, German doctor who gave a number of his patients diluted sewage to drink for as much as thirty days, not letting them know the nature of the loathsome draught they were taking. He did not notice any bad effects from the experiment, and so concluded that sewage was a safe article of diet at all times. The same experiment is being constantly tried in our cities and towns. I do not doubt that many a person is enjoying his daily dose of diluted sewage from the old well in his back yard, and because it has not yet made him sick, or he has been able to lay the blame of any sickness upon some other cause, he concludes, as Dr. Emmerich did, that the well is all right and its water entirely above suspicion.

Living organisms are present in all waters. Even if originally lacking, they would be acquired very quickly on exposure to the air. These organisms are of many different kinds, but we can divide them into two divisions, the harmless and the disease causing, pathogenic as they are called. These latter form the most dangerous impurity of water, if we can so call them. Some of these organisms or bacteria, as we shall call them, wage a busy warfare upon the others, and succeed in destroying many of them. This doubtless brings to an end many pathogenic bacteria, preventing their multiplication, but it will not do to trust to such means as our only safeguard. These bacteria are found in the air and in the soil. The germs seem to be almost everywhere waiting for some suitable medium upon which to settle and multiply. Bacteriologists claim to have found them even in the pure air of the higher Alps, and in hailstones coming from very elevated regions of our atmosphere. They are easily destroyed by sunlight and by dry air. They are generally found only in the first three feet in depth of the soil, reaching their maximum as to numbers at from six to eighteen inches. The walls of a well form a continuation of this life range, so that one can find these at a considerable depth.

A full study of the impurities of water requires the services of an experienced chemist and a bacteriologist. I say advisedly an experienced chemist, because I wish you to understand that I attach almost no importance to the various easy tests recommended by some for the use of any one who wishes to find out for himself whether the water is impure or not. In the first place, because qualitative tests alone are in this case of very little value, and further, because no good, all-round test has ever been discovered. The permanganate test, the silver chloride, and others are often quite misleading, especially in untrained hands.

The chemist has to determine the total amount of solid matter, but he need not determine the nature of this mineral matter. It is only important to know that it does not exceed certain limits. Then he generally contents himself with obtaining a knowledge of the amount of chlorine, the amount of ammonia, of what he calls albuminoid ammonia, of nitric acid in the combined form as nitrites, and of the total organic matter, and of nitrous acid as nitrates. He does not concern himself with the other impurities which may be present at all. The reasons for this mode of procedure are simple. In the first place, it is hopeless in our present stage of knowledge to attempt to determine all the different kinds of organic matter in the very minute amounts in which they may be present. Secondly, this knowledge, if we could get it, is not absolutely necessary. The chemist wishes to find whether those forms of matter which best noursh the disease-germs are present. Animal organic matter is then most to be dreaded, and of this mainly the nitrogenous portion. If animal matter can be detected, and thus the impurities traced to an animal origin, there may be a strong suspicion that disease germs are also to be found. As to the vegetable organic matter, he contents himself with burning it or using some oxydizing agent upon it merely to determine whether it is in excessive amount or not.

Considering then, first, the chlorine, the chemist regards this as pointing to common salt, which is one of the most easily detected components of animal sewage. Of course some common salt will be found in any water which has percolated through any depth of earth. Sometimes, as near the ocean or large deposits of salt, the chlorine found in the water will be quite large in amount. The chemist must know something of the average amount of chlorine to be found in the water of the section from which the sample came in order that he may be able to decide whether the chlorine exceeds the normal amount or not. You will notice what a devious path he is forced to tread. First, he supposes that the chlorine found came from common salt, then he must fix upon a certain amount of this as normal to that particular water; then he takes for granted that all chlorine in excess of that came from the salt of animal secretions. Where he is occupied with the repeated analysis of the same water throughout a long series of experiments, he is justified in these assumptions, but where it concerns one single analysis of an unknown water, he is guessing very much in the dark. The fact is, the chemical analysis of water is most useful when the same water is analysed week after week or month after month, and the changes in it carefully noted. This is done for the water supply of London, New York and many large cities, and should be done for all.

As to ammonia, the chemist distinguishes between two different kinds of ammonia; first, the free ammonia; this may come in part from the atmosphere, but very little is usually gotten from this source; the rest of it comes from the decaying organic matter which originally contained nitrogen. The second kind of ammonia he calls albuminoid ammonia. Many chemists object to this name, but most of the analysts so report it in their analyses of waters submitted to them. It means the ammonia which is gotten by the action of strong chemicals upon the undecayed organic matter present in the water. It does not exist as such in the water, but is formed by the treatment during the analysis. Tnis, of course, points more directly to the presence of animal matter than the other ammonia, and the chemist regards the healthfulness of the water as open to grave suspicion if much of it be found.

Some of the organic matter containing nitrogen in decaying changes into nitric acid rather than ammonia. The first stage of this oxidation is nitrous acid, which, of course, would only be found in the state of combination as nitrites. The nitric acid in the same way would be nitrates. These may be gotten from the air, but only in very small amounts.

We have seen, then, that the chemist looks for a few things in the water, not because they are within themselves dangerous, but because he believes that they point to dangerous constituents. And he chooses these, furthermore, because he has for these some of the most delicate tests in his entire repertoire and it is incumbent upon him to detect them when they are present only in a few parts in the million of water, or even in the ten million. You must not blame him for this. So subtle are the dangers which may lurk in a polluted water that they are almost beyond our clumsy grasp. The chemist is reduced to guess work. He is on the outlook for danger signals. If he is put in control of a water supply, and watches it as an engineer does his train, he can detect the red flag in time but he can speak with certainty only of a very impure water indeed when is allowed only one glance at it.

I will mention that the chemist often reports other things as determined besides those mentioned, but they are of minor importance, and the practice concerning them is not uniform.

When the chemist is at fault, who will help us decide whether the water is impure or not? Bacteriologists have shown themselves very helpful in ferreting out those living organisms mentioned as the most dangerous of all the impurities. They can roughly count the number of the bacteria, and they can give some idea as to their nature, whether dangerous or not, but they cannot yet tell us all that we would like to know about these pest-breeding germs.

The combined work of chemist and bacteriologist is incomplete and unsatisfactory without the aid of the sanitary engineer who can examine the surroundings of the well, the watershed of the stream, &c.

HOW WE CATCH COLD AND THE BEST MEANS OF PREVENTING IT.

BY DR. S. WESTRAY BATTLE, OF ASHEVILLE, N. C.

(Read at Washington Health Conference.)

What we commonly know as a cold is scientifically and properly a catarrh, from the Greek word Katarreo, I flow down; and a cold in the head is scientifically a coryza; but by whatever name it may be called, its main feature is acute inflammation beginning in the upper respiratory tract, and commonly begins with a feeling of chilliness, hence the common name of cold, which may be or may not be attributable to external causes. Sometimes the sense of chilliness is absent, there being only a sense of languor and indisposition. Not infrequently there is no sensation of any unusual kind until a feeling of stuffiness is experienced in the nostrils, or severe headache, and hoarseness, or cough, or oppression of the breathing. This affection is also frequently ushered in by sneezing. The usual course of colds attacks the nostrils first, and afterwards the air passages leading to the chest, when it commonly takes the name of bronchial catarrh or bronchitis. If it habitually attacks the chest without running through its ordinary course, as above indicated, there is often some special cause of delicacy or weakness about the lungs, and such persons should see to it that this tendency is eradicated by observing some of the measures to which I shall call your attention, else a chronic inflammation of the lungs, or consumption, results, the direct malady which we have to contend with at the present day—the scourge of modern civilization.

Colds are most common in temperate latitudes, especially in changeable, moist climates and the winter months. Perhaps this fact in a great measure accounts for the prevalence of tuberculosis or consumption in temperate, moist climates, which prevalency also may be accounted for by the now well established communicability of consumption through the medium of the bacillus tuberculosis, the name by which we know the germ of this disease, and about which I endeavored to make you acquainted some months ago in Salisbury, to the end that we might lessen the frequency of this disease by exercising the proper precautions in our daily life and association with one another. So then we have noted the fact that this affection, common cold, usually begins in the nostrils. The discharge is usually at first watery, becoming afterwards more abundant and glairy, and frequently of a yellow color. There is usually more or less irritation of the surfaces affected, and probably no one of the little miseries of life is more prostrating and discouraging than a bad cold in the head.

Experiments intending to prove the contagiousness of common cold have resulted negatively, though we do have epidemic influenza, the results of which, in the form of tuberculosis, nervous prostration and almost numberless complications are very much in evidence to-day, though we are now enjoying a lull in this distressing and dangerous affection. There is no danger of mistaking the diagnosis of this affection, and it can only be doubtful when the attack is the forerunner of some acute specific disease as measles or the early stages of hay fever. Mentioning hay fever reminds me that perhaps it may not convey to your mind just what I mean, and I don't know that anybody ever conveyed to my mind, satisfactorily, just what hay fever is, but it is a sort of autumnal catarrh very lke an ordinary cold. It is supposed to be caused by pollen from some of our fall wild flowering plants, more especially the rag-weed, but goldenrod and a number of other plants come in for their share of responsibility. Even the rose, which by any other name would smell as sweet, is a rank poison to some of these hay fever sufferers ; so common in fact in some parts of the country, to give the name of rose cold to the trouble.

Ladies and gentlemen, don't neglect your colds, your own or your children's. Simply because colds get well, or have the tendency to do so in the healthy, does not relieve us of the responsibility of preventing such attacks or doing everything in our power to shorten and prevent the complications which sooner or later will manifest themselves if we take not warning.

Let us briefly take up the homely methods of treating a cold before we discuss preventive measures, though I may be justly accused of putting the cart before the horse; yet to fully appreciate the essence of the thing we must first have it, then forewarned we should gird up our loins and be forearmed ever afterwards. So we may divide treatment of colds into absorbtive and preventive measures.

The ordinary duration of a cold being more or less indefinite, our main effort should be to render the attack as short as possible, bring about a reaction and equalize the circulation which has been upset by this peculiar process which has affected the delicate system of nerves presiding over the caliber of the blood vessels. Confinement to the house, and usually to the bed, is usually the first step for a day or two, and nothing is better in the very beginning than a warm bath, even a hot foot bath will usually suffice to remove the chill, and then a laxative and light diet will, more often than not, break the cold attack in forty-eight hours. The ancient maxim to starve a fever and feed a cold, in these days of progressive medicine does not carry with it the same force that it did in days of your. If the exposure has been unusual, and the attack ushered in with great discomfort, I know nothing better than a cup of hot water, to which has been added a teaspoonful of paregoric (for a grown person,) to be repeated in a couple of hours; or hot whiskey or brandy, should the paregoric be objectionable, under ordinary circumstances would be followed by marked relief. In case of children the most speedy relief is the family physician, and just here I will emphasize the fact that a stitch in time should be the watchword.

The prevention of recurring attacks of sickness is one of the most important problems for treatment and calls for our most careful consideration. General measures for such prevention may be discussed under the heads of Exercise, Bathing, Clothing and Local Surroundings.

Vigorous and properly directed "training" is an exceedingly valuable means in controlling the catarrhal tendency, and in fairly healthy young subjects, should always be advised. Walking, gymnastics and horseback riding are capital exercises. Wheeling, with correct posture, though exercising a limited set of muscles, may be followed and give excellent results when combined with suitable indoor exercise for the arms, back and chest. Light gymnastics may be carried out by those not sufficiently vigorous to take the heavier forms of exercise. You will be surprised and delighted with results of such exercise properly carried out, oftentimes when local measures had been tried to no purpose. So much for exercise.

Regular and frequent bathing, combined with daily cold sponging of the face, neck and chest is decidedly beneficial in preventing colds, but a certain amount of precaution is always in order in the technique of the bath. Some constitutions will not brook a cold plunge under any circumstances, and in weak and catarrhal subjects such a procedure may be hurtful or the reverse of good, and during the winter months, especially, should be avoided. In such cases better energetic friction either with plain, rough, or salted towel should follow the bath, which should be as cold as the individual's nervous constitution will permit. Friction should be continued until the skin is decidedly reddened.

Patients with well marked catarrhal tendencies should wear woolen underclothing of sufficient weight during all seasons, garments of three degrees of thickness being required. The heavier weights should be put on with every marked fall of temperature, whatever the season. Underclothing of such persons, which has become damp from perspiration, should be changed as soon as possible, even if several times a day. Warm woolen garments also should be worn at night, a point very much neglected but very important; and in no case should clothes worn during the day be retained during the night Woolen stockings should also be worn in the winter months.

Let us review some of the sanitary advantages claimed for woolen garments next to the skin.

1st. "Wool gently stimulates the skin;" *i. e.* to that degree necessary to excite and maintain its normal activity in secreting and extruding the waste matter, and surplus fat and water of the body.

2d. Wool, relative to linen and cotton, is a non-conductor of heat and electricity, and, therefore, tends to preserve to the animal body its normal measure of these vital energies.

3d. Wool, properly woven and made up, by reason of its permeability to moisture (the vaporous exhalation of the skin) promotes the elimination of the effete matters, and the reduction of the abnormal or excessive heat of the animal body; and this is the reason why *the body, even when freely perspiring, remains dry in woolen clothing*, while in linen or cotton it becomes wet—a fact of common experience with all who engage in athletic exercises.

4th. Wool thus co-operates with the skin to regulate, by its exhalations, the temperature of the body, the wool supplementing the efforts of the skin to dispose of excess of heat, whether proceeding from internal or external sources, thus maintaining that equable state which is the true condition of health and comfort. Hence it is that wool is better than linen or cotton as a preventive of the overheating of the blood through internal heat; and that woolen clothing is less oppressively hot than linen or cotton in summer, and therefore more agreeable and healthful in the hottest climate.

5th. Wool is electrical, while linen and cotton are not; *i. e.* wool generates electricity but does not conduct it. It follows, therefore, that a body clothed in wool loses less of its animal electricity, while fresh electricity is produced on the surface. Most people are familiar with the facility with which the human body conducts electricity. Cotton ranks next to it as a conductor, while wool is classed with non-conductors and insulators, and for that reason is called an electric or generator of electricity. When the air is clear and dry, place a person upon a stool or chair, the legs of which are supported from the floor by glass tumblers, and beat him gently on the back with a woolen or camel hair shawl, and sparks may be drawn from his nose or fingers from one-fourth to three-fourths of an inch long—or large enough to light the gas of a burner or charge a Leyden jar. Probably every one has seen and heard electric sparks on withdrawing a woolen stocking—never from taking off a cotton one. There is no manifest electricity in the latter case, because the cotton fibre conducts it away—dissipates it.

Woolen clothing is, therefore, salutary for those whose bodies are deficient in animal heat or electricity. With persons leading sedentary lives the action of the skin is deficient and it requires the stimulating aid of the woolen clothing, which materially assists in eliminating from the tissues the excess of water and fatty matter, always tending to accumulate when insufficient exercise is taken.

Chills caused by draughts or colds, damp clothes or bedding, are very dangerous, because the sudden suppression of the cutaneous exudations interferes with the circulation of the blood, thus disturbing the action of the lungs, the liver, the stomach, etc., and setting up conditions favorable to inflammation.

Their *modus operandi* may be summarized as follows:

The exhalations which are "mal-odorous" and noxious by reason of defective excretory action, are generated in the body during and after the digestion of food, during all vital action in fact, or when the body is invaded by the disease or the mind is at work or disturbed by worry, gloom, anger or fear, or indeed by any violent passion or strong emotion. For every act of mind or body is attended with destruction of tissue, constituting so much waste matter, which becomes poisonous and potent for mischief, if not duly eliminated from the body. This elimination it is the function of the skin, in an eminent degree, to do. The sudorific or sweat glands and their ducts are charged with this important office. There are about 7,000,000 of these little scavengers opening at the surface of the skin of an average-sized man, throwing off the surface from 28 to 32 ounces of refuse matter every 24 hours. The action of even a small portion of them cannot be suspended without disturbance and danger.

The body not only gives off its exhalations to the surrounding air, but it also communicates them to all objects with which it and its atmosphere come in contact.

Metallic substances, glass and wood, of which the pores are closed by paint, varnish, etc., are practically impervious to the exhalations, while the two classes of material next mentioned absorb them, but in a very different degree.

I. All vegetable fibres, such as linen, cotton, hemp, jute, paper, unvarnished and unpainted wood, silk, attract and absorb these noxious, self-poisoning exhalations, and become, when in contact with beings, gradually offensive and even poisonous in their effect. Clothing (including linings and padding), and bedding made from such fibres, are agreeable and wholesome only when quite new and just washed, but soon become saturated with the noxious exhalations, producing discomfort, and, if wet, when the vapors are set free, becoming especially dangerous.

II. All kinds of animal wool and hair, feathers and horn, readily absorb all the excretions of the skin, but they do not retain them, but transmit and disperse them at their outer surfaces by a repulsve energy to which the self-cleansing properties of hair and wool fabrics are properly due. The value of this feature is hardly to be exaggerated.

Stout soled shoes should be worn in all weather, and the feet should be encased in overshoes on wet days, as damp feet are always a serious menace to persons of catarrhal tendency.

In regard to the local preventive measures to protect those of catarrhal tendency, or who catch cold easily, much may be said.

Bad air of all sorts acts as a direct irritant, and air laden with minute fragments of any hard substance, such as stone, coal or steel and dust, is injurious, and while not causing, scientifically speaking, colds, frequently sets up inflammation in the mucous membranes tantamount to this condition, and keeps the mucous membranes tender and sensitive. Breathing such air, of course‘ should be avoided, and persons whose occupation compels them to breathe such an atmosphere should wear a respirator, or a flat, dampened sponge, over the mouth and nostrils while exposed.

So, in a paradoxical manner, Mr. Chairman, I seem to have told you how we catch cold by telling you how to avoid it.

MALARIA AND ITS PREVENTION IN EASTERN CAROLINA

BY JULIAN M. BAKER, M. D., OF TARBORO.

(Read at the Washington Health Conference.)

The prevention of malaria is of importance to the economist as well as to the sanitarian. It is of special importance to us in Eastern Carolina, because, in some form, it exists in nearly every locality, extending far into the Piedmont section; because the mortality is greatly exaggerated in the minds of non-residents, and because there is a means of prevention which, if known and carried out, will surely eradicate it. It is constantly decreasing in New York, Philadelphia, Baltimore and most of the large cities as the knowledge of its nature and cause has become better understood, until at present it prevails to the greatest extent in low, marshy, country districts, principally in Mississippi, Arkansas, Louisiana and Texas. In Europe it has constantly decreased until at present its habitation is confined principally to Southern Russia and parts of Italy.

The influence of soil and climate in the production of Malaria is universally recognized, but as yet it is impossible to determine whether certain localities are malarial by any means other than by observing the effect which residence in those localities produces upon the Caucasian race. Low, marshy lands with an abundance of vegetable matter, heat and moisture, and summer and autumn, are favorable conditions for sustaining and developing the virus.

Malaria may be defined to be an "infectious disease, always accompanied by the hæmatozoa of Lavaran, and characterized by fever of an intermittent or remittent type, or by a chronic cachexia with anæmia and enlarged spleen." What the virus consists of occupied the attention for a long time, but after the observation of Klebs and Crudeli in 1879, additional interest was manifested in investigating it. The experiments of Lavaran in 1880, and their subsequent confirmation by Marchiafava and others in Italy, by Councilman, Osler and Joseph Jones in America, and more recently by French, German and English scientists, are conclusive that it is a parasite and belongs to the hæmatozoa. No observer, says Osler, who has undertaken the proper study of the blood in malaria has failed to recognize the parasite. Its nature and affinities are not definitely determined, but investigators in England, France, America, Italy and India are unanimous in the opinion that these bodies are always present in malaria, and that they disappear simultaneously with the administration of quinine. The changes produced in the blood by them are sufficient to account for the symptoms and morbid anatomy. The transformation of the hæmoglobin by the plasmodium results in the pigmentation which is so characteristic. The amœba passes through a cycle of existence, during which toxic substances are developed, possessing the property of causing a necrosis of the red corpuscles, resulting in anæmia.

How the parasite enters or leaves the body; how and where it is propagated; whether it develops in some aquatic plant or animal, is not determined: but the study of its life as revealed by clinical experience leads to certain conclusions which future investigation will doubtless confirm.

The term malaria means "bad air." This indicates the long accepted origin of the disease, and indicates the avenue of entrance to the respiratory tract, or the skin. If a micro-organism is the cause, as is now conceded, and its habitat is fermenting organic matter in the soil, it is certainly a reasonable conclusion to arrive at that the entrance could be more readily effected through the mouth and the digestive tract than by either lungs or skin. It is well known that the system succumbs more readily to malarial influences while fasting; doubtless this is explained by the fact that the micro-organism has to reach the alkaline intestinal tract before developing its pestilential manifestations, and this is more easily done through an empty stomach than a full one, with the protective influence of active gastric digestion. If it is true that the usual avenue of entrance is the mouth, the entrance into the blood must be made through the intestinal tract, and the prevention of the disease and its total eradication is brought within the region of possibilities. Instead of contending with a hydra-headed micro-organism pervading every breath of air we breathe, lurking in every evening breeze, whose whereabouts we know nothing of, we would have a simple little parasite trying to get into the intestines through an empty stomach.

The topographical and meteorological conditions in Eastern Carolina furnish a most suitable environment for the life of the malarial germ: so our effort must be directed primarily to the prevention of the development of the germ outside of the body, and then its entrance into the body. Notwithstanding the fact that Sternberg failed to find the germ in the marsh mud of Louisiana, the low marshy lands of the Roman Campagna, the bottom lands of Mississippi, Arkansas and Alabama, and the low lands of our section are too familiar as favorite localities for the worst forms of malaria to controvert the fact that heat, moisture and decomposing vegetable matter constitute the favorable environment which we must first remove in order to prevent the germ's development. It is inexplicable at present that these marshes and low lands have been known to become healthy without apparent change in previously favorable conditions for development; it is highly probable, though, that the germ will never disappear unless the environment is changed. Clearing, draining and cultivation will accomplish this in a measure. Oxygen being necessary, as claimed by Crudeli, to the existence of the germ, close sodding with grass after drainage is the best sanitary cultivation. The Carolina poplar or cottonwood tree, eucalyptus and several others, have gained a reputation as absorbers of the virus from miasmatic atmosphere; doubtless one tree is as good as another for this purpose, and the claim of those mentioned is referred to only to deny it absolutely. The usual avenue of entrance being the intestinal tract, although a respectable minority still hold that it is the lungs and skin, how is the germ to be prevented from entering the system? Bartley, of Brooklyn, has recently found the malarial organisms in the drinking water from the source of common supply of the city of Brooklyn, which only serves to establish what was already accepted—that water is the most efficient carrier, and when containing the surface washings charged with decomposing organic matter was a satisfactory abiding place and furnished a suitable pabulum, not only for malarial, but many other pathogenic organisms.

In Eastern Carolina the water supply is principally from shallow wells, ten or twenty feet deep, in wet seasons the water rising very near the surface level. The question of prevention resolves itself into one of purifying the water from shallow wells, or getting purer water from some other source. By boiling the well water all vitality is destroyed and dead organic matter is harmless. This is the only safe rule if any well water is to be used. The custom prevails in some malarial sections to boil enough water in the morning for the day's consumption. After boiling it should be placed in a porcelain cooler and closed up. By using only boiled water the malarial attacks may be reduced to a minimum. It is a matter of common observation that, in families using boiled water, those who, for some reason, do not drink it have been known to have malarial attacks while others escaped.

Purer and better water can be obtained from deep bored or driven wells and cisterns. When proper care is exercised in collecting, no better water can be procured than cistern water. The Board of Health has done great good in disseminating information in regard to bored wells. They are coming into more general use, and wherever used malaria prevails to less extent; but the pump gets out of order, is troublesome to repair, and doubtless, too, after a while, unless very deep, these wells become contaminated and their use is discontinued. Artesian wells, where practicable, will fill all the requirements of pure drinking water, except in very rare instances. Their use is beginning to attract attention everywhere. Experimental wells are being sunk in many places, and no good reason exists why artesian wells should not be generally used in our section.

Eastern Carolina needs purer drinking water. This can be obtained by boiling ordinary well water, by using cistern water properly collected, deep bored or artesian wells. Let our people realize this and put it into practical operation, and Eastern Carolina becomes at once the healthiest, the richest and the grandest section of our commonwealth.

THE BOARD OF HEALTH AND THE PUBLIC—THEIR RECIPROCAL RELATIONS.

BY GEORGE GILLETT THOMAS, M. D., PRESIDENT OF THE BOARD.

(Abstract of Paper Read at the Charlotte Health Conference.)

Responding to the address of welcome by Dr. H. M. Wilder, Superintendent of Health of Mecklenburg county, Dr. Thomas said:

For the State Board of Health I thank you for your kindly welcome to your flourishing town. I would like to say, before submitting what few remarks I have, that we felt in coming to Charlotte for our conference that no city is as large, thrifty and energetic as Charlotte. We would like to make our presence here as agreeable as possible, and make this a working meeting. We have called these meetings conferences. We would like to make them as profitable as possible, and with that end we desire that, if there is any point which we can elucidate, you will not hesitate to ask questions.

We are a self-invited body in your midst, carrying out a plan that was inaugurated two years ago of instituting conferences with the citizens of the larger towns and cities of the State upon matters pertaining to the sanitary conditions that must interest all good people. We do not believe that we are any the less welcome because we have asked ourselves into your flourishing community, and we are gratified that you should honor our coming with such an intelligent and interested gathering. The circulars which announce our program also request that this meeting shall be resolved into a conference in fact, and that it is the wish of the Board that any one of you who desires information on health matters that it is supposed we are in possession of will ask for it, either by direct question or through the question box which has been provided. I wish to ask your attention for the few minutes that are accorded me to a short discussion of the relations of the Board of Health and the people of the State. The fact that doctors not only make a living among you, but that the number of doctors seems to increase, is fairly good proof that there is need for preventive as well as curative medicine in this honorable and ancient borough.

The duties of the sanitary or health officers are so manifold that they involve a knowledge of pathology, because this science implies an exact study of the causes of diseases in their relation to the living human body. A knowledge of vital statistics, involving an accurate account of the population, the births, deaths and diseases, is held necessary for the purpose of enabling proper comparison to be made which would give evidence of the effect of the various conditions on the population. It implies a knowledge of chemistry and the use of the microscope for the purpose of judging of the impurities of air, earth, food and water, and the chemistry is to help in the application of deodorizing and disinfecting agents. It necessitates such knowledge of natural philosophy as will aid in providing for ventilation and atmospheric changes, and for the proper government of such manufacturing processes as are alleged to be hurtful to health. This complex knowledge makes it incumbent on Boards of Health to be provided with physicians, chemists, engineers and men who will devote all the time necessary to laboratory investigation.

The composition of the board demands the presence of several practitioners of medicine, an engineer and a chemist. The law provides for the foundation of county boards of health, to whom is given the authority to elect the superintendent. To him is intrusted the safety of the people whose servant he is. He is made by law the master of the situation when infectious disease or diseases dangerous to the public health appear. He is responsible for the quarantine and disinfection of diseases named in the law, and if he perform faithfully the part laid out for him, his office is no sinecure, nor his lot an easy one.

Provision is made in the statutes for the gathering of vital statistics—a most important item, one of value for comparison at the headquarters, and for the information of local health authorities.

The State Board of Health considers itself bound to do all in its power to back the people—to protect them and provide for their sanitary betterment.

In return, they ask of you citizens of a town that boasts, with justice, of its enterprise, thrift and growth, to see that its laws and they are the laws of the State, are obeyed.

No town with the reputation of Charlotte can afford to be laggard in the strife for general good.

PUBLIC WATER SUPPLIES AND THEIR PURIFICATION.

BY J. C CHASE, OF WILMINGTON, ENGINEER OF THE BOARD.

(Read at the Charlotte Health Conference.)

The character of the water furnished for public use is a matter of the highest importance to all concerned, and it is hardly necessary to say that the source of supply should be above reproach. Yet such is the general public indifference that, were it not for the never-ending missionary work of the physician and sanitarian, our land would stand a fair chance of devastation by filth diseases that would rival the death-dealing plagues of former times.

The completion of a system of water-works, the source of supply being of a satisfactory degree of purity, is too often considered as a final settlement of the water question. So far as the public health is concerned, a polluted water supply is likely to be more detrimental than the former supply drawn from local wells, for these would be likely to be of varying degrees of badness, and a general epidemic of sickness would hardly be likely to ensue. However, this should not be considered as a valid reason for continuing to rely upon the wells, but rather as an incentive to labor for a higher standard of purity in the public works.

To consider the question from a financial standpoint solely, no city can afford to tolerate a water supply that is known or suspected to be detrimental to health. The loss of time, which is money, caused by the resulting sickness, the expenses of nurses and medical attendance, the loss to the community by death of actual or prospective wage-earners, soon amounts in the aggregate to a sum far in excess of that required to secure and maintain a water supply of unquestioned purity.

One typhoid patient poisoned the water supply of Plymouth, Pa., in 1885. There were over 1,100 cases of fever in a population of 8,000, and 104 deaths resulted. A careful calculation showed that the care of the sick and the loss of wages by those who recovered amounted to $97,120. Those who died were annual wage-earners to the extent of $18,420.

These startling figures need no elaboration or explanation; they speak for themselves.

Comparatively few persons in any community have a realizing sense of the necessity of maintaining perfect sanitary conditions about every public water supply. Until a growing sanitary sentiment controls a majority of the votes needed to elect the governing officials of our cities and towns, we are destined to be subject to the rules of those who do not see the wisdom, even from a business point of view, of doing everything within reason to raise the standard of public health. It is certainly within bounds to say that any public officer who passively allows, without protest even, the continued use of a polluted source of water supply, is morally responsible for the natural resulting consequences.

Not less difficult of solution is the question of securing a satisfactory supply of water when the ownership of the water-works is corporate instead of municipal. In that case we have a commercial condition to deal with in addition to the sanitary indifference before mentioned. We shall undoubtedly be told that the consumer's interest is the company's interest, and that the company cannot afford to furnish that which the consumer does not desire or approve of; but if we get behind the scenes we shall more than likely hear the consumer being told that he is hypocritical, and that if he is not satisfied with the fluid that is being dispensed to him he is not obliged to take it, but can procure his supply elsewhere, if he can.

The recent civil suit against the water-works officials of Duluth, Minn., to recover damages for a death by typhoid fever, which, it is claimed, was caused by the impure condition of the water supply, is a radical move in the right direction. It will have a tendency to develop a feeling of responsibility in the minds of such officials, and, we trust, lead to a more careful oversight of water supplies.

Some one has said the wrecking of savings banks and thieving by employees of the postal service were two crimes that could not be punished too severely, as a large majority of the victims had no way of protecting themselves from loss. The furnishing of an impure supply of water, by either indifference or negligence, is worthy of a place in the category of crimes above mentioned, and we see no good reason why an offence that menaces health and life should receive a lighter penalty than one against property alone.

The development and growth of the water-works business, if it may be so termed, has been almost phenomenal. In 1870 there were only 243 systems of public supply in the United States. Now it is safe to say that there are in the neighborhood of 2,800, representing an aggregate outlay of $200,000,000.

A quarter of a century ago, a city of less than 25,000 inhabitants hardly dreamed of a public water supply; now, scarcely a hamlet but what aspires to have this great convenience, which has passed from the domain of luxury almost into that of necessity.

In the State of Massachusetts 154 of the 353 cities and towns have water works; every place with a population of over 4,500 being supplied, and only 11 with a population exceeding 3,000 being unprovided.

Perhaps it is not too much to assume that this somewhat abnormal growth of the business has been no small factor in creating a demand for improving the condition of the supply. In the more thickly settled sections of the country it is getting to be no easy matter to procure a supply of satisfactory quality within a reasonable distance.

The earlier enabling acts for the construction of water works passed by the Massachusetts Legislature specified "*fresh*" water; later ones called for "*soft*" water; then came a period of "*pure*" water, until the supply was exhausted, and now they simply call for "water." There is food for reflection for us in the question as to what we are getting. Is it *fresh*, *soft* and *pure*, or merely water? If ignorance is bliss, perhaps the inquiry should not be pressed.

The Metropolitan water supply has recently been inaugurated for the benefit of Boston and the neighboring towns within a radius of ten miles. An expenditure of $20,000,000 is contemplated, the supply being obtained from a distant water-shed that is practically free from pollution, and whose ultimate limits will furnish the supply that will be required a hundred years hence. It is only a question of time when the same course will have to be taken by the other large centers of population in our country.

The sources of supply may be placed in two general classes, surface and ground water. The surface supplies are derived from lakes and ponds, running streams or the impounded waters of those whose usual flow is not sufficient in quantity to supply the daily demand in the driest season.

Natural lakes or ponds usually afford the most desirable supply, and if situated at a distance from habitations, or in an uninhabited territory, the water is generally of good quality and reasonably free from actual or prospective pollution. Still, it is not safe to assume that once pure, always pure, and the only certain way of keeping track of the condition of the supply is to have frequent and regular analyses, both chemical and bacteriological.

It is the unexpected which always happens, and there are several instances where a first-class supply has been seriously polluted by the filth of a single family. A noted sanitarian well says:

"No one point in sanitary science has been more conclusively proved than that a given water supply may be safe to-day, and dangerous to-morrow, and safe again a week later. It is not in the water, but in that which the water transports, that the danger lies. A sudden shower may foul the wayside spring. A picnic party may cause the contamination of a mountain brook."

When the supply is drawn from a running stream that receives the household and mechanical wastes of another center of population, we are confronted with a state of affairs that calls for vigorous condemnation. It is a well-defined condition, not a theory.

There is very often a variance of opinion regarding the actual status of some particular source of supply, when it may not be practicable to show that it is positively deleterious to health. Interested parties will be prone to belittle any objections that may be raised, and very often will dispute evidence that should pass uncontradicted.

It is a well-settled standard that waters that can be shown to contain any substance that is deleterious to health are unfit for domestic use. The determination of this fact is the province of the water analyst, and his final decision must be authoritative.

It is also proper to require that the supply shall have no offensive associations or characteristics, although they may be matters of sentiment rather than fact. Boating, bathing and fishing in the bodies of water from which the supply is drawn would come under this head. Of course the smaller the body the greater the objection, both as a matter of sentiment and fact. The turbid waters of streams are also objectionable on the same score, even though they contain nothing more detrimental than the earthy matter held in suspension, which is removed to a great extent by sedimentation before it reaches the consumer.

The highly colored waters of the South Atlantic Coast can be placed in the same category, although they may contain nothing that is really objectionable.

The prevailing sentiment requires a colorless, odorless, and tasteless water supply, of a proper degree of purity. While such a supply in its natural state may not be easily obtainable, the improved means of purification now available make the requirement one that can be and should be satisfied.

Ground water supplies are obtained from springs or wells of different types, the natural filter gallery, so called, being virtually an enlarged well. These supplies are usually of good quality, and are practically nothing but filtered surface water. Geological conditions play an important part in settling the question of securing supplies of this nature, and comparatively few are thus derived. The water very often possesses a degree of hardness that is tolerated because nothing better can be had.

Supplies drawn from wells are not always free from danger of pollution. If the wells are shallow and located at no great distance from contaminating influences an excessive draft which, sooner or later, is very likely to ensue, will cause practically the same pollution that would be found in a surface supply in the same locality. A case of this kind has recently come under the writer's observation.

Artesian well supplies are generally free from organic contamination, but usually carry in solution an amount of mineral matter that renders them unsatisfactory for general use. There are notable exceptions, it is true, but a very small per cent. of the water supplies of the country are obtained in this manner, and the geological conditions in many localities preclude the idea of any great increase in the number.

Where a supply of a satisfactory quality is not available, or the existing supply has become contaminated, the question of purification becomes a vital one. In the early days of water-works construction comparatively little attention was given to the purity of the supply. A single analysis was usually made, and if the result showed that the supply was of a satisfactory quality the question was considered settled for all time. Bacteriology and nitrification, like the telephone and electric light, had hardly begun to occupy the realm of the imagination, and the only purification of public water supplies considered necessary was the removal of matter held in suspension, as in the case of turbid rivers. This was usually done in an imperfect manner by sedimentation in large settling basins.

The halcyon days of blissful ignorance have gone never to return, and now the sanitarian does not feel satisfied as to the condition of the supply unless it is analyzed several times a year. We confidently expect, however, that the discovery of a successful way to eliminate all known pathogenic bacteria will only be the signal for the advent of others equally as detrimental to health.

The filter beds that are in general use in Europe never flourished on American soil. In fact, the subject of filtration has received comparatively little attention on this side of the water until within a very few years, and at the present time there are in the United States less than one per cent. as many users of filtered water as are found in European cities.

Several attempts were made to procure supplies from natural galleries adjacent to large streams, but the results were far below the expectations, and it was generally found that the supply obtained came from ground water intercepted on its way to the stream instead of from the river itself. This method has been generally abandoned altogether or supplemented by other devices.

Within a few years a growing sentiment in favor of purification by filtration has taken root, and many supplies are now being filtered whose original condition was much superior to that of many now in use whose quality has never been questioned.

Filtration in general is not a matter of experiment, so far as the results are concerned, but purely one of cost, which is by no means prohibitive.

It is perhaps too much to expect the general adoption in this country of the elaborate and costly devices that are used to such an extent in European practice. We have, however, thanks to American ingenuity, several varieties of apparatus known as mechanical filters. While the devotee of filtration in its strict sense would be inclined to resent that name being applied to the devices, holding that strainers would be a more appropriate term, considering the speed with which the water is passed through them, the fact cannot be disputed that they have as a class done efficient work, and are fully entitled to the name of filter, which, in its broad sense, is a water purifier.

Their efficiency is largely increased by the use of some coagulating agent, commercial alum being the substance most generally employed, although lime and ferric salts are sometimes used. The function of the coagulant is to form by decomposition a gelatinous precipitate, which draws together and surrounds the suspended matter present in the water, and by increasing its bulk makes it much more easily removed.

This type of filter using coagulants has been very successful in removing bacteria, and the opinion is ventured that it will be the only type of filter that is commercially available for water-works systems of small size. The large and wealthy cities can well afford the expense of the costly structures of English and Continental practice, but the salvation of the smaller systems of this country will undoubtedly depend upon the mechanical filter.

We may note, however, that several cities of good size in the South and West are firm believers in the merits of mechanical filtration, notable examples being Atlanta, Chattanooga and Knoxville. There is one well-settled principle in filtration, and that is that it must be done at the fountain head. We cannot afford to have a polluted water supply for general use, and trust to the integrity and intelligence of the ordinary house servant to keep the filters in running order and see that an unpolluted drinking water is supplied. The one omission may be the death-warrant of some loved one, and unavailing regrets for careless inattention to a specific duty bring not back the departed.

An outbreak of typhoid fever in a Massachusetts city was traced to the drinking of the impure river water. Irreproachable water from the city supply was in the factory, but the carelessness or indifference of the help led some of them to use this river water, because it happened to be a little more convenient.

The recent investigations of the Massachusetts State Board of Health, relative to intermittent filtration, are of profound interest and great importance.

The investigation has extended over a period of several years, and is not yet concluded. The usual type of bed filter has been used, but the principle has been developed that the intermittent application of the fluid to be filtered produced the best results. The filtering material thus has a chance to drain, and, becoming thoroughly aerated, the tendency to nitrify and destroy organic life becomes stronger, and under proper conditions the bacteria die much more rapidly in the aerated sand. This method was originally designed for the treatment of sewage, but the results were so successful that the city of Lawrence decided to construct a filter plant on this plan for the purification of the city supply. A filter bed with an area of 2½ acres has been in operation for some three years, and the mortality from typhoid fever has been decreased 40 per cent., at least one-half of which can be credited to the filter.

The practical results of purifying a polluted water by filtration are shown by the experience of Hamburg and Altona in the cholera epidemic of 1892.

The water supply of Altona is polluted to an unusal extent, the river Elbe at that point carrying the crude sewage of three-fourths of a million people; yet such was the efficiency of its filters that they scarcely felt the effect of the cholera, which made such ravages in Hamburg. The natural conditions in Hamburg were far superior to those in Altona, as the Altona intake was below the sewage outfalls of both cities, while the Hamburg supply was contaminated by neither, only being subject to the natural pollution of the stream before it reached the city.

Altona's supply was filtered while Hamburg's was not. The sacrifice of over 8,000 lives was a dear object lesson; but if "the blood of the martyrs is the seed of the church," they died not in vain, for Hamburg now has an efficient filtration plant, with a result that the death-rate is the lowest ever known.

A few words about the water supplies of our own State may not be out of place at this time. Of the sixteen systems, three draw their supplies from artesian wells, a deep well and springs; two use the ponded water of small streams, one of which has built a filter well, which undoubtedly has and will continue to have for some time to come a more or less beneficial effect upon the supply. The other one would probably be improved by like treatment, although the existence of any pollution is not apprehended. The other supplies are surface waters from streams of varying size and character, the most of them not being above suspicion, and all of them in their natural state being susceptible of great improvement, certainly so far as appearances are concerned.

Eight of this class are supplied with filters of the mechanical type, which certainly improve the looks of the supply.

We note with pleasure the marked increase of interest in improving the quality of the supplies, whatever may be its inciting cause, three of the filters having been installed within two years.

As to the quality of the work done, "that is another story," as Kipling says, and I am not in a position to speak with authority. Suffice it to say that the installation of filters is only a means towards an end, and upon their intelligent operation depends the success of the venture. An uncared for filter may become a prolific source of disease.

To sum up, the large majority of our public water supplies are of uncertain or suspicious character. In the natural course of events they will grow worse instead of better. However, with a growing sentiment requiring a higher standard of purity, it is perhaps not too much to predict that a generation hence the purification of public supplies will become well nigh universal, and that the sanitarian of that day will be able to chronicle as great an advance in the purification of water supplies as the past twenty years has shown in their development.

NORTH CAROLINA'S INSANE.

CAN THE STATE CARE FOR THEM?

By P. L. Murphy, M. D., Superintendent of the State Hospital at Morganton.
(Read at the Charlotte Health Conference.)

Statistics are said to be unreliable. This is true of the insane population of North Carolina, as will be seen, and yet there is no other way to arrive at any conclusion upon which to base an opinion. The census of 1880 shows the population of North Carolina to have been 1,399,750. The number of insane were 2,028, or one insane person to every 690.2 of inhabitants. In 1890 the population was

1,617,947. The number of insane was 1,725, or a small fraction less than one insane person to every 938 of inhabitants. If these figures are true, we have a fast-decreasing insane population in this State.

Are they true? is a question of the greatest interest to us. I greatly fear not. For reasons which do not concern us now, great doubts are entertained of the correctness of many of the census returns. A sample of this is found in the report of the Board of Charities of the State of Illinois for the year 1873. The chairman of the Board, Mr. Wines, shows in this report that the number of insane in Illinois was 3,005 instead of 1,625 as returned by the census enumerators. He, besides this glaring error, discovered on the lists returned to the Superintendent, General A. F. Walker, 123 names counted twice.

Further comparisons will be made, taking the census reports as a basis, to show that it is more than probable that there is less insanity in North Carolina than in the general population of the United States. We have seen that the proportion in North Carolina in 1880 was one lunatic to every 690. In the United States, taken as a whole, it was one to every 545. In order to obtain correct information upon which I could base some reasonable conclusions, a circular letter was sent to the Superintendent of Health, to the Chairman of the Board of County Commissioners, to the Clerk of the Superior Court in every county in the State, enclosing a form for reply and a stamped envelope. Replies were received from 22 of the 44 counties of the Eastern district and 37 of the 52 counties of the Western district. Having made such a complete failure in collecting information on this subject from all over the State, I have decided to limit myself to the white insane of the Western Hospital district, for the reason that I am more familiar with the white insane of this territory, having had opportunities to gather information of large numbers outside the walls of the hospital at Morganton. Even with these opportunities the statistics collected are incomplete, but surely true as far as they go, certainly representing the minimum of the white insane in Western North Carolina.

From the 1st of August, 1895, to the 1st of August, 1896, 113 males, 15 females, total 271 persons, were legally committed to the hospital; of this number 77 males, 98 females, total 175, were admitted; 25 males and 44 females were for various reasons refused admission; 11 males, 27 females, total 38, were ordered admitted, but their friends declined to send them. Of the number refused admission 12 males and 3 females were either idiots or dotards, and manifestly from our laws, surely under the existing circumstances, were not proper subjects for hospital care; 16 males, 41 females, total 57, would have been admitted had room been abundant. Almost all the males and a few of the females who were refused admission were epileptics. Many of these women actually need hospital treatment; a few, with all the men refused, only custodial care. I learned from the several replies received in answer to the circulars that in addition to the above there are 31 men and 44 women in the 37 counties heard from. Assuming these 72 persons to be proper subjects for the hospital, we find 47 men and 82 women, a total of 129 persons outside the hospital who should have either its treatment or its care. At the time of writing this paper there were 692 patients in the hospital, a total of 821 in the district, whose names can be called. This does not include the persons whose applications were made previous to August, 1895. Some of these are yet at home, and others for whom commitment papers have not been made are known to be waiting for hospital care as soon as room can be had for them. It can be safely estimated that there are now not less than 250 white insane persons in this district not in the hospital, the large majority of whom should be under its care. By calculating the Western district as two-thirds of the State, the whole of the white insane can be estimated near enough for our purposes. Taking the highest figures of all these estimates, our State falls far below any other civilized country known in the number of its insane. It will, I am sure, be of general interest to pursue this subject farther and to quote from various writers.

Mr. F. B. Sanborn says " that in Massachusetts in the last thirty years the population has doubled while the number of insane has trebled." The editor of the *American Journal of Insanity*, in referring to a discussion on the subject of the increase of insanity, says: " So uniform is the story that has come for years past from every civilized country that a person who abides by facts, be they pleasant or unpleasant, rather than by cheerful theories, has no choice but to believe that insanity is increasing at a rate quite out of proportion to the rate of increase of population."

It is not universally conceded that insanity is so rapidly increasing as it appears from the increasing demand for hospital care. Without going into that any further, it is some comfort to know that perhaps after all it is not as bad as it appears. It is an unquestioned fact that, with the better care lunatics receive now, they live longer than formerly; that in many countries more accurate enumeration is made; and that this, at least, accounts for part of the apparent increase. Your attention is drawn to the fact that from both sources of information, to-wit: the number who sought room in the hospital, and from those reported in reply to the circular letter, more women demand room than men. This, notwithstanding that there are 40 more women in the hospital. This is so noticeable, and, besides being interesting, is so important that I venture to give more detailed facts. From the opening of the hospital at Morganton to the end of the last fiscal year, December 1, 1895, 1,833 patients have been admitted, 894 men and 934 women. The census for 1890 shows perhaps a larger relative population of insane women in the state, viz.: 755 men to 960 women. There are some 20,000 more females than males in the state, but this does not account for the large difference.

Regis in his book, "Practical Manual of Mental Medicine," says in general statistics of insanity that the male sex figures more largely than the female. The proportion is 114 to 129 males to each 100 females. This includes cretinism and idiocy, which are more frequent in males. If these are excluded, which is done in the above statistics of North Carolina, a certain equilibrium is re-established. "If we go further," says he, "and take ont all the cases of general paralysis and alcoholism, we find that pure insanity is more frequent in the female than in the male." Other authorities claim that the proportion becoming insane is practically the same. This, perhaps, includes alcoholism and general paralysis, both of which are rare in North Carolina. There are other reasons why the number of insane women is greater, even admitting the same number are attacked, and there are reasons, too, why more seek hospital care. Society demands protection for women who by disease have been deprived of the inborn instincts which guard them against vicious and lewd men. This is best accomplished by sequestration. By reason, too, of their physical organization women need better protection from the viscissitudes of life. Prof. Alonzo Clark, in his lectures to his classes, always repeated this proverb, which he had originated, 'A man and a dog can live afield; but a woman and a cat must have a home.'"

Many men really insane are competent to make a support for themselves and sometimes for their families, whereas women are an additional burden. The chiefest of all reasons is, however, that more insane men die and more recover than women.

The statistics in the hospital at Morganton for twelve years show that of the 894 men admitted 356 recovered, nearly 40 per cent., and 149 died, 16.6 per cent. Of 939 women, 363 recovered, nearly 39 per cent., the exact difference is 1.1; and 149 died, 15.8 per cent., something less than a difference of 1 per cent. This apparent trifling difference shows larger in large numbers, and is a consideration. Whatever the causes may be is immaterial to our present purpose. It is a fact that there is a greater demand for admission of women in the Western North Carolina Hospital District.

Having shown, if indeed it needed further demonstration, that there are a large number of insane people in North Carolina that need hospital and asylum room, it remains to show how this can be supplied, the best means to provide for them, and after that the cheapest. The limits of this paper will not permit a thorough discussion of all the phases of this important question. I must, therefore, assume many of these to be settled, or, at all events, it is the experience of those who have given them the most serious study.

The State of New York in the late sixties or early seventies made a new departure by establishing an asylum for the chronic insane at Willard.

After 10 or 15 years of trial the experiment was pronounced a failure by its previously warmest advocates. The next trial was in Pennsylvania, at Wernersville, on a new plan. It was proposed to profit by the mistakes of New York, and the advocates of the Wernersville plan were sanguine that at last the great problem was solved. So far it has not been the success its friends hoped for. However that may be, North Carolina is not in a condition to make costly experiments, and that project will be dismissed as not feasible. County care ought to be summarily disposed of by saying it has been tried and found wanting in every State and in every country, but it has some advocates in this State, and perhaps a short space should be devoted to it to show its undesirability, its cruelty to the helpless insane and how utterly at variance it is with the spirit of the age and the humane feelings of our best people. It is not necessary to go outside our State to find examples of cruelties and barbarity worthy only of the darkest age, and yet our people are not cruel or parsimonious to the extent of allowing cruelties and barbarities practiced on the helpless insane, nor are they indifferent to the sufferings of these afflicted people. It is rather because the great mass of our citizens are not aware of the real state of things, or are unable to correct this great wrong.

Every one who has looked into this question, and who desires the best care of the insane, believes that the State ought to assume charge of them. The counties will not, indeed cannot, care for them, asylums (limiting the meaning of that word to institutions for chronics, which it means) have proved unwise and have been discontinued almost everywhere. There remain three other systems, the boarding-out or Scotch system and the colonization near present hospitals and the separation of the criminal and very dangerous insane from the innocent and comparatively harmless.

We may dismiss the first in a few words. Only mild lunatics can thus be cared for, and then there would be little or no economy in this. The plan has been tried in Massachusetts in a limited way, probably as many as 100 out of 7,500 being cared for in this manner. In as sparsely a settled State as North Carolina, it would be almost impossible to have State supervision, which is essential to properly carry out the plan. The colony plan and the establishment of an institution for criminals in the penitentiary I believe are the only ones that can be adopted in this State that will afford the relief desired, and yet be within the means of our people. "Prodigality," says Dr. Wise, of New York, "in expenditure of tax funds for eleemosynary purposes is not only a wrong principle but its reaction upon political and public sentiment retards and injures the object we are seeking to effect, as the history of provision for the insane in several States clearly illustrates."

It is to the interest of the insane themselves that those whose duty it is to try to provide for them should studiously avoid any waste of the means our taxpayers are willing to give for this purpose. This idea will be kept constantly in view in the recommendations to be made. I must ask again that some axioms mentioned be accepted as true. They are not my opinions alone, but the combined wisdom of those physicians who have spent their lives in hospitals for the insane. It is impracticable now to build another institution in North Carolina. The insane must be provided for, then, by the present institutions. There should be one acre of land belonging to the hospital for every patient cared for. It is not possible without a greater outlay of money than can be afforded to buy sufficient land contiguous to that owned by the hospitals, but land not further away than five miles (the nearer the better) may be bought cheap enough. On these outlying farms colonies for both men and women can be established in not expensive cottages, and farming and other operations can be carried on just as is now done at the central institution. One of the great expenses connected with the hospitals for the insane is the necessary officers to conduct the business of the establishment. There will be no need for another superintendent, steward, matron, engineer, farmer, etc., it being easy to conduct these colonies under the management of the central institution, the expensive administrative building, barns, store-room—a very costly part of every hospital—having been already provided.

The criminal insane will be disposed of before going further into the colony system. Several of the States have had for years separate institutions for criminals. The persons confined in these represent three classes: Penitentiary convicts who become insane while serving terms in the State prisons, persons who are tried for crimes, who are found to be insane at the trial, or to have been insane when the criminal deed was committed, and those well-recognized lunatics who commit deeds of great violence while in the hospital or at large. The penitentiary of North Carolina is ample enough as it is now used to easily and cheaply care for all criminal insane. There is no need to employ any other officer or to erect any other building. The present hospitals would get rid of a dangerous class of lunatics, who are a menace to the whole house, and thus lose to a greater extent the prison idea of the hospital, a condition desired beyond measure. There are 26 criminals now in the State Hospital, and they occupy the most valuable and the most needed room in the institution. If the judgment of the court was confinement in the asylum for criminals for life, we would hear less of the plea of insanity in murder trials.

In order to properly understand the comparative cheapness of the colony system, a full knowledge of the cost of the present institution should be had. The cost of the hospital at Morganton before the additions of congregate dining-rooms and cottages was about $900 per bed, or $900 for every patient accommodated. The one at Raleigh was about the same, the one at Goldsboro about $500 per bed. Throughout the United States the average is even larger than this ; perhaps $1,200 per bed would not be an exaggeration.

The trial of cottages near the present building at Morganton has been made at a cost of something less than $200 per bed. There was practically no cost for water, and very little for plumbing or disposition of sewage in this. I believe, including the cost of land, and if water is convenient, cottages for 400 to 1,000 patients can be erected for $250 per bed, or even less. If the State would adopt this plan systematically and, say, appropriate small sums yearly, the work could be done for even less than $250 per bed. A large cost of building is the brick, and by establishing a yard with brick-making machinery, the cost of brick could be reduced to nearly one-half our present prices.

Much, if not all, of the work of making brick, and the excavating, can be done by male patients, and thus still further reduce the cost. The advantages do not stop with the erection of the cottages in less costly way than has heretofore been followed in this State. The Pennsylvania Lunacy Commission, in advocating the establishment of an asylum for chronics at Wernersville, claimed for it the advantage that the patients would make it nearly self-sustaining, because the quiet working patients would be taken from all the hospitals in the State and sent to Wernersville. In short, none but producers would be sent there. The commission did not seem to consider that the other hospitals would lose by being deprived of their working patients, and that quiet, working patients are subject to attacks of violent excitement. It is a fact, I am told by one who knows, that such is really the case. The management of the older institutions is hampered by having their organized working parties broken up. There is a constant going of quiet patients from the hospitals to Wernersville, and of greatly excited ones back to their respective institutions. This is not only inconvenient but expensive. In the cottage plan proposed these transfers could be made without cost, and without interrupting in any way the ordinary everyday workings of the organization. At one time it was customary at Morganton to send home the so called harmless and incurable to make room for acute cases and those who were violent and dangerous. This is not now resorted to if it is possible to avoid it. It is only a question of degree; every insane person may with reason be called dangerous. During the month of September last a so-called harmless lunatic in North Carolina made a desperate effort to wreck a train. A harmless lunatic who left Morganton hospital went home and killed one of her children within a month.

The cottage plan has been tried to a greater extent at Kalamazoo, Michigan, than in any other institution in the United States known to the writer. A letter addressed to its accomplished superintendent, Dr Wm. M. Edwards, asking for information as to this system, elicited this reply: "As long ago as 1886 the board of trustees of this asylum (Kalamazoo), failing to secure land contiguous to the location of the main buildings, purchased a farm of 176 acres two miles and a half distant. Afterwards 80 acres were added, making the present size 256 acres. On this was built a wooden house and a large barn, and we began the experiment of producing our own milk. We now have 56 cows there, largely Holstein grades. Forty-seven male patients, of the chronic, laboring class, live there. The farm is under the supervision of a man and his wife, and with the help of two other men and two other women, all the work of caring for the patients, cooking for them, attending to all these cows and to the farm and garden work, there being several acres of the latter, is done by this help and the patients before mentioned. This experiment proved so successful that a year later the trustees bought another farm of 357 acres. On that there are now four brick houses and 250 patients; 67 men and 183 women reside there. There is a resident physician who superintends the whole of the 'colony,' as it is called. As the patients are mostly of the class before mentioned, there is not a very great deal of active medical work. There are, however, frequent calls for a physician, the maintenance of discipline and other matters incident to the care of so many persons, which keep the doctor busy during the whole time. Patients living in the cottages assist with the ordinary housework; cooking is done within each cottage, and on the whole living is more satisfactory than within the main building. The patients, as a rule, improve in general health by being transferred to the cottages; the outdoor life that most of them lead renders them more robust, and there is greater contentment than in the larger institutions. We find, also, that maintenance is cheaper in the cottages, but I attribute this largely to the fact that the class of patients there would be more easily maintained wherever they are located than the more actively disturbed and destructive chronic cases. Among the drawbacks to our plan is the fact that we possess two farms instead of one, the distance away two miles and a half, and the fact that we are obliged to cart supplies from the main institution. We shall probably not in the immediate future enlarge the colony unless we are able to construct an electric railway between our main asylum and that, in which event other cottages would probably be erected to make room for the growth of our district."

The hospital at Morganton is full to overflowing. I believe the female department is the worst crowded institution in the country. The insane women of our district are knocking at our doors in vain. The directors have by rare economy and thrift saved a small amount of money with which they are erecting a building for women. Even when this is finished the demand for room will not have been supplied. The institution at Raleigh is also building room for a hundred or more. The one at Goldsboro has just finished a large addition, sufficient at least for some time to come, which is a wise and proper policy, for the sick negro has no home, and is a charge upon the county. The State has furnished her colored insane with accommodation; should she do less for her white people?

The Board of Health deserves the hearty thanks of the friends of the insane everywhere for using all its power to further their material interest. The work the board gave me has been a work of love, for no one knows better the suffering these unfortunate and helpless people undergo, and no one would labor harder to relieve them.

Gentlemen, my task is done in the best manner I could in the time allotted me. Let us all hope that, imperfect as it is, it will draw public attention to these afflicted and suffering human beings, and that relief will speedily follow.

THE EFFECTS OF ALCOHOLIC BEVERAGES.

BY DR. S. WESTRAY BATTLE, U. S. N., OF ASHEVILLE.

(Read at the Charlotte Health Conference.)

Ladies and Gentlemen: I am not here to deliver a temperance lecture, though I have but little doubt that there are those among you who will feel when I shall have finished that my talk has been in effect tantamount to that sort of a discourse; nor indeed shall I be sorry if it proves productive of good in calling attention to a subject so important to us all.

My reasons for choosing the subject, "The Effects of Alcoholic Beverages," are two-fold:

First, because it is one of universal interest, and has engaged the attention of some of the best thinkers on hygiene since the beginning of civilization.

Again, I am impelled to the consideration of this important subject, through a sense of duty as a member of the Board of Health of North Carolina, to do what I can in my feeble way to disseminate a more general knowledge on a matter so germane to the public health.

I shall endeavor to confine myself to the rational or scientific consideration of the effect of alcoholic beverages in health, and when used in excess, that we may all of us know just how necessary or unnecessary they may be to us in dietetics. The moral side of the question I shall leave to others who can more appropriately do justice to the subject; though I cannot but just mention in passing that it has been stated, and I believe truly so, that if alcohol were unknown one-half of the sin and a large part of the poverty and unhappiness of the world would disappear.

Although intensely personal to myself, I will mention how curiously I was led into a choice of this subject. Not many days ago my friend, Dr. Lewis, Secretary of the Board, and myself were in correspondence concerning some health matters, when I had occasion to say that I was not up to much, and was fearful lest I was in for my annual gouty attack. I perhaps had a sneaking notion, too, that making such an announcement to my friend would rather excuse me from any active participation in the proceedings of the Board of Health here. But not so; I got no such encouragement. In due course of mail there came along a letter from the good doctor, full of commiseration for me, but winding up with a parting injunction somewhat to this effect: "Take to horseback as you did last winter, old-fashioned country doctor style; keep good hours; don't work too hard; and be chary of your beer; I count upon you at Charlotte; let me know the title of your paper." So there is gout, beer, paper at Charlotte. And so it occurred to me, though I have not the slightest idea the amount of beer I consume has anything to do with my gouty ailments, I may err on this point, as we are ever prone to excuse ourselves, perceiving with great clearness the mote in our brother's eye, while we look through, around and by the great beam in our own; still, as I say, it occurred to me that such a topic was one of interest, and I would endeavor to present the subject as well as I could in the space of time allotted to me, and show the good doctor I was not afraid of handling the subject without gloves.

I shall divide my subject into a brief consideration of the different kinds of alcoholic beverages; the physiological action of alcohol; its influence on the various organs, and as an article of diet in health.

I.—BEER.

So we will return to the matter in hand, and for the purpose of convenience classify the alcoholic beverages under the heads of beer, wine and spirits.

Beer, as you all probably know, consists of malt and hop extracts, alcohol formed by fermentation, and salts added in the water used, or present in the malt and hops. The specific gravity varies from 1,006 to 1,030, and even more in the thick German beers. Simple lager beer has a specific gravity of 1,016 as compared with water, which we call 1,000; so you observe it is but little heavier than water and contains about 5 per cent. of alcohol, though this varies from 1 to 9 and 10 per cent. with the different kinds of beer. The malt, which is in the form of extract in beer, is from 4 to 15 per cent. It is least in the bitter and highest in the sweet beers and ales. The hop extract is in much smaller quantity. Beer also contains some free acid and a small amount of sugar.

II.—WINES.

The composition of wine is so various that it is difficult to give a summary. The chief ingredients are:

1. Alcohol from 16 to 25 per cent. It has been stated that the fermentation of grapes, when properly done, cannot yield more than 17 per cent of alcohol, and that any amount over and above this is added.

Port wine, 16 to 23 per cent.

Sherry, 16 to 25 per cent.

Maderia, 16 to 22 per cent.

Marsala, 15 to 25 per cent.

Bordeaux red, Chateau Lafitte, Margeau La Rose, Barsac, St. Emilion, St. Estephe, etc., 7 to 13.

Bordeaux white, Sauterne, Barsac, etc., 11 to 18.

Rhine wines, Johannisburgh, Hochheimer, Rudesheimer, etc., 7 to 16.

Champagnes, 8 to 13, and so on.

We readily see from the above how the amount of alcohol in wines varies, even from the same district.

To tell how much alcohol is consumed in any given quantity of wine or beer, measure the bottle in ounces and multiply it by the percentage of alcohol, with the decimal point before it. For example: A pint bottle of beer is supposed to contain 16 ounces. I don't know a single brewing establishment, by the way, that gives an honest pint; their so-called pint bottles hold anywhere from 11 to 15 ounces, but for illustration we will take it at 16 ounces. We have stated the quantity of alcohol in beer at 4 per cent. Now multiply 16 by .04 and we have as a result .64 of an ounce, rather more than one-half ounce of absolute alcohol, equivalent to two tablespoonfuls of whisky, which we will see contains about 50 per cent. of alcohol. In other words, a bottle of beer is in alcoholic potency about the same as an ordinary drink of whisky.

2. Ethers. A number of ethers enter into the composition of wine. It is stated that there are 25, or even more, of these compound ethers in wine, as oenanthyllic, malic, citric, tartaric, etc. The "bouquet" of wine is due to these compound ethers, especially nanthyllic, and remains as long as the wine is sound, becoming more pronounced as the wine ages.

3. Other ingredients are sugar, free acids, a small amount of fat, coloring matter and salts, 1 to 3 per cent. The specific gravity of wines depends upon the amount of alcohol and solids, and varies from 975 to 1050.

III.—SPIRITS.

These contain the largest quantity of alcohol of all the alcoholic beverages. They are made by distilling fermented grapes (brandies), fermented molasses (rum), fermented malt or malt and grain and other materials (whisky). The quantity of alcohol varies from 50 to 60 per cent.

Brandy contains, besides alcohol, a number of the compound ethers already spoken of, coloring matter of the cask or caramel; tannins are also present. Perhaps it is not generally known that all spirits are colorless when fresh from the still. Burnt sugar or caramel is largely used, I believe, to give proper color, which also seems to carry along with it the idea of age and a certain mellowness. Irish and Scotch whiskies derive a peculiar flavor from the malt or other material being dried over peat fires, or by the direct impregnation of peat smoke.

Gin is only alcohol diluted, with a little oil of juniper and other flavorings, and sweetening agents added. The specific gravity varies with the amount of alcohol, ranging from 930 as low as 870.

It may be interesting to give the names of some of the distilled spirits used in different parts of the world.

Hindoos, Malays, etc., use Arrack, Rice-Areca nut.

Greeks and Turks, Raki and Mastic, Rice-grape skin.

Hindoos, Toddy, Cocoanut.

Chinese, Samshoo, Rice.

Japanese, Sacie.

Pacific Islanders, Kava or Kawa, Macropiper.

Mexicans, Pulque, Agave.

South American, Chica, Maize.

Russians and Poles, Vodki, Potato.

Abyssinians, Tallah, Millet.

Tartars, Koumiss, Mare's Milk.

The physiological action of the alcoholic beverage differs from that of pure alcohol, as they contain bodies besides alcohol, as we have seen, which have a certain physiological action of their own, and great distinction must be made between the effects of alcohol taken in dietetic doses and the effect when taken in excess. Beer has an action of its own, probably due to the active principles of the hops, lupulin, used in its manufacture. In small quantities it is soporific; and taken in large quantities it becomes noticeably depressing in its action, probably from the lupulin mentioned, which is the active principle of hops, a narcotic of medium potency. When beer is taken daily in excess, or even moderately for a long period, it leads to plethora or a deposit of fat by lessening the oxidation or tissue changes in the body; hence come many of the anomalous affections classed as gouty, against which our esteemed secretary was advising me. The question, "What is excess?" is not easy to answer, and will depend both on the composition of the beer and the habits of life of those who take it; but judging from the amount of alcohol which is allowable, (within the health limit,) from one to two pints of beer is sufficient for a healthy man per day.

Now, then, let us run over the effects of alcohol. The effects of the alcoholic beverages upon the human system in health will be better appreciated by a consideration of the physiological effects of alcohol, their most important constituent.

On the stomach: When taken into the stomach, alcohol is absorbed with little or no alteration, at once passing into the blood and then throughout the body. Its presence may be detected in almost any organ of the body soon after it is taken. Its effect on the stomach is pronounced; in small quantities it aids digestion, though some stomachs are intolerant of it in any form. In larger quantities digestion is retarded, the mucous membrane is reddened and a condition of chronic catarrh is produced—among the early indications of which may be mentioned morning cough, retching or "gagging," nausea being easily provoked; continued, it causes an increase in the connective tissue between the glands, and finally a degeneration and obliteration of these parts, when stomach digestion is destroyed.

On the liver: In large quantities taken daily, it increases the size of this organ, by increasing the connective tissue till the very growth of the latter so encroaches on the glandular structure that it is destroyed, the capsule of Glisson shrinks, the organ becoming smaller, and there results a condition of the organ variously called "gin liver," "toper's liver," and "hob-nail liver," the last-named from the irregularities brought about by the shrinking process. When this takes place health is gone. The integrity of the organ is compromised, never to be restored.

On the lungs: In large quantities, habitually taken, the effect is perhaps less noticeable on the lungs than many of the other organs of the body, though bronchial catarrhs and emphysema are common in those who take much alcohol.

On the heart and blood vessels: It undoubtedly increases the force and quickness of the heart's action. Dr. Edmund A. Parkes, of London, a distinguished writer on hygiene, and to whom I am indebted for much of the subject matter of this paper, found that brandy augmented the rapidity of the pulse 13 per cent., and that the force was also increased; going further, he found, taking the usual estimate of the heart's work, its daily excess of work with 4.8 fluid ounces of absolute alcohol was equal to a force that could lift 15.8 tons one foot high.

It causes dilatation of the superficial vessels, as shown by the red ness and flushing of the skin. Authorities differ as to whether alcohol lowers the temperature in health or not, but the influence must be inconsiderable. In some cases of fever there is little doubt that it does lower the temperature, especially with children, and perhaps in health, when given in medium doses, it may lower the temperature by dilating the superficial vessels, whereby more blood comes to the surface, and thus more heat is lost by radiation and the increased perspiration. It most assuredly lowers the natural resistance of the body against cold—hence stimulants should be taken at the end of an exposure rather than in the beginning or middle. When exposed for a long period to intense cold a drink may give one a feeling of comfort and exhileration, but the power of resistance is lessened, and many instances are recorded where death has occurred, under such conditions, during sleep.

On the nervous system: On most persons it acts at once as an anæsthetic, blunting the sensibilities, lessening the rapidity of impressions, the power of thought and the perfection of the senses. In other cases it causes increased rapidity of thought and excites the imagination, but even here the power of control over a train of thought is lessened. There is no question that several brain diseases, including some cases of insanity, are caused by the excessive use of alcohol. Degenerative changes in the various organs of the body result from the immoderate use of alcohol, and the latter has aptly been called the very "genius of degeneration;" nor are these degenerations confined to the notoriously intemperate. As Dr, Parkes says: "I have seen them in women accustomed to take wine in quantities not excessive, and who would have been shocked at the imputation that they were taking too much—although the result proved that for them it was excess." To some individuals alcohol in every shape or form is a poison, not necesrily producing intoxication, but causing sooner or later those degenerative changes which appear to be in all cases the same, fatty and fibroid.

Dietetic use: Is alcohol desirable as an article of diet in health? No hard and fast rule can be laid down on this point, and no satisfactory answer can be given with our present knowledge. There comes in the question of environment, the poverty or ease, the hard mental or bodily labor which may surround healthy individuals, hence the value or the want of value of a comparison of the health of the teetotaller with those who use alcohol in moderation. There are individuals in both classes enjoying the maximum of health and the greatest vigor of mind and body. There are arguments for and against the utility of alcohol in health. One of the chief arguments brought forth to sustain the utility of alcohol is the almost universal use of it among the civilized nations of the earth. Dr. Parkes is fair and broad-minded, and after an exhaustive discussion of the question arrives at the following conclusions: "The facts now stated make it difficult to avoid the conclusion that the dietetic value of alcohol has been much overrated. It does not appear to me possible at present to condemn alcohol altogether as an article of diet in health; or to prove that it is invariably hurtful, as some have attempted to do. It produces effects which are often useful in disease and sometimes desirable in health, but in health it is certainly not a necessity, and many persons are much better without it. As now used by mankind, it is infinitely more powerful for evil than for good; though it can hardly be imagined that its dietetic use will cease in our time, yet a clearer view of its effects must surely lead to a lessening of the excessive use which now prevails. As a matter of public health, it is most important that the medical profession should throw its great influence into the scale of moderation; should explain the limit of the useful power, and show how easily the line is passed, which carries us from the region of safety into danger, when alcohol is taken as a common article of food."

If alcohol is useful, it is obviously important to determine just when the limit of usefulness is reached. Experiments have not been numerous, but fairly accurate on this point. Dr. Parkes says Dr. Anstie found that one fluid ounce and a half caused the appearance of alcohol in the urine, which he regarded as a sign that as much had been taken as could be disposed of in the body. The experiments of Dr. Parker himself and those of Count Wollowicz corroborated this result. In terms of the alcoholic beverage this would mean, giving the outside limit as one and one-half ounces of absolute alcohol, that this quantity would be equivalent to three fluid ounces of brandy (50 per cent.); seven and one-half ounces of sherry (20 per cent. of alcohol); or 30 ounces of beer (5 per cent. of alcohol); and Dr. Parkes says: "I believe that this standard is fairly correct, since from inquiry of many healthy men who take alcohol in moderation I find that they seldom exceed the above amount." There is no doubt that the greater part of the abuse of alcohol to-day arises from the pernicious habit of treating. You have treated me, so I must in turn, before we separate, treat you. American ways are good enough generally, but there is a viciousness in this, the like of which would be hard to find anywhere; nor has the custom the underlying principle of true politeness, from which in its inception nothing was further than the imposing of an obligation.

Allah be praised! the custom is on the wane. Likewise the general hard drinking of a few years ago.

The passing of the morning cocktail, or ante-prandial toddy, is also to be noted with loud praise. I am informed on good authority that drinking of spirits in the clubs of New York city has notably decreased of late years, beers and wines of moderate alcoholic power taking their place largely. In France, where water seems to have been relegated to the bath-room and kitchen, and the light wines, especially the light red wines, are drunk to a surprising degree, drunkenness is far from common; indeed, it is a rare thing to see an intoxicated person. It is always better, even with the lighter alcoholics, to take them with the meal. We are creatures of habit.

THE INFECTIOUSNESS OF MILK.

BY RICHARD H. LEWIS, M. D., SECRETARY OF THE BOARD.

(Read at the Charlotte Health Conference.)

Of all food products milk is the only one which is absolutely essential to the life of man. In the economy of nature it is his sole support in the most critical period of his existence, *i. e.*, at its beginning, when his vital machinery is most easily thrown out of balance. But while it is indispensable in infancy, it also occupies a most important place in man's dietary through life, particularly with children and invalids, and very properly, for it is the only single article of diet that is a complete food in itself. If it can be shown, therefore, that it is frequently the carrier of disease it is easy to understand and appreciate the tremendous importance of the subject we have under consideration.

Before taking up the subject proper it would, perhaps, not be amiss to consider for a moment what we mean by the "infectiousness of milk." The word "infect" is derived from the Latin "*inficere*, to put in, or corrupt," and means "to communicate or transmit the specific virus or germs of disease." It goes without saying that pure milk in itself is not infectious. We mean by the infectiousness of milk that it is the medium of transmission to man of the specific virus, or germs of disease, when itself becomes contaminated therewith. And it constitutes a most excellent medium for such transmission because it is a rich "culture medium," as the bacteriologists say, for the growth of the various germs which cause disease. The object of our inquiry, therefore, will be,

1. How these disease-producing germs get into milk, and the best way to prevent it, and

2. Not being able to prevent their entrance into the milk, the best way of killing them and at the same time leave the milk in good condition as a food.

In the limited time at my disposal I can treat the subject only in the most general way, and must omit a great mass of extremely interesting observations which have been recorded, but I will try to be as clear and practical as possible.

We will first consider what may be called the general infection of milk as contradistinguished from the specific—its contamination with pure filth, so to speak, in which there is no specific disease germ. Every housekeeper in this audience has observed, at one time or another, in pouring out milk which has been standing some time in a pan or pitcher, a dark sediment at the bottom. This sediment is composed of several ingredients, but it is chiefly particles of manure which have fallen into the milk-pail from the udder, teats and flank of a dirty cow. Although this filth will not cause any particular disease of itself, it assists in the development in the milk, under certain conditions, of most virulent poisons by supplying more food for the bacteria, which generate the poisons to feed on.

Diseased cows may transmit through their milk diseases of various forms, not the specific disease with which they are suffering, but certain "upsettings" of the human constitution. This is especially the case when the seat of the disease is the udder. The most common of these diseases is what is called garget, or inflammation of the bag, in which the milk becomes lumpy, stringy and mixed with pus or "matter." As bearing on this point, and illustrating to what extent the scientific enthusiasm of some men will carry them, I will give one instance. A Dr. Brush produced artificially a case of garget by bruising one-quarter of the udder of his cow. The milk from this quarter was of the character above mentioned and alkaline, while that from the other three-quarters was apparently healthy and acid. After four days, he gave his own child, 16 months old, four ounces of this acid but otherwise normal appearing milk, at 5 o'clock P. M. The child fell asleep, but in two hours awakened crying, apparently with stomach ache, and was kept awake till past midnight, during which time a large amount of acid was voided per rectum. The next day the bowels were slightly disturbed, and the doctor asks, "What would be the condition of the child had it been fed continuously on such milk?"

Improper feeding will also produce such changes in the milk as to disorder the digestive apparatus of infants. It is a fact well known to mothers that too free an indulgence in fruit and vegetables on their part will often upset the nursing babe. And so it is with the milk of cows feeding on certain weeds, cabbage, turnip tops, swill, or other fermented food. The very interesting and mysterious disease known as milk-sickness or "the trembles," which is met with in our own mountains, is supposed by some to be caused by cows eating poison-oak, though it has not yet been demonstrated. Whatever the cause of this disease may be, it seems to exist in certain circumscribed localities, which are known in some instances and kept fenced off from the pastures. I would refer those interested in this subject to a valuable paper by Dr. J. Howell Way, of Waynesville, the intelligent and efficient Superintendent of Health of Haywood county.

The specific diseases transmitted through milk are typhoid fever, diphtheria, scarlet fever, tuberculosis, or consumption, and cholera.

That *typhoid fever* is communicated to man by means of infected milk has been thoroughly demonstrated. A sudden outbreak of the disease among those obtaining their milk from the same dairy has suggested that as the cause, and investigation has shown the contamination. As many as 138 epidemics of milk-typhoid have been tabulated. The cow does not convey the germ to the milk herself, except possibly by drinking, or more likely wading in polluted water and infecting the udder, but the poison is introduced after the milk is drawn. This may be done by the infected hands of a milker who has been nursing a case of typhoid, or who has a "walking" case himself, but generally it is by washing the utensils, or deliberately watering the milk with infected water—typhoid fever being almost invariably a water-borne disease.

The *diphtheria* and *scarlet fever* poison is also usually introduced into the milk from the outside, the disease prevailing in the families of the dairymen or others who handle the milk, but there is evidence to support the view that they are sometimes attributable to the milk of cows having inflammatory or ulcerative affections of the udder. In such affections the presence of certain microbes known as streptococci and staphylococci has been demonstrated, and according to Drs. Busey and Kober, there are many reasons for believing that some cases of diphtheria and scarlet fever, or diseases that cannot be clinically differentiated from them, are caused by infection with these cocci. It also seems to be a fact that the most malignant forms of diphtheria nearly always show this cocci infection as well as that with the specific diphtheria bacillus.

Tuberculosis. The mere statement of the established facts that one-seventh of all deaths are due to tuberculosis, and that cows are very subject to this disease, identical with that found in man, is sufficient to show the very great importance of studying the milk in this connection. To give you some idea of the prevalence of tuberculosis among cows, I will read a few statistics. In 1885, 15 per cent. of the cattle slaughtered at Leipsic were tubercular, at Stolp 20 per cent., Bromberg 26 per cent., while at Berlin the percentage was much higher. Of 67,077 cattle butchered at Leipsic during the years 1888–91, 20.4 were tubercular. In this country, Dr. Ernst, of Massachusetts, on the evidence of 39 veterinarians, representing 17 States and reporting on 3,000 cattle, gives 18 per cent. tubercular and 8 per cent. suspicious. Dr. DeSchweinitz, of our own State, now connected with the Bureau of Anima

Industry at Washington, says that in many cases from 50 to 70 per cent. of the dairy herds examined were found to be infected, and in one of these 50 per cent. had tuberculosis of the udder. The statistics of other countries show a similar state of affairs.

The presence of tubercle bacilli in milk was first demonstrated by Virchow and Koch in 1882, and their observations have since been confirmed by many bacteriologists. That the disease, generally in the slower forms, which are commonly spoken of as scrofula, is transmitted through the milk of tuberculous cows to children previously healthy and without hereditary taint has been conclusively shown by numerous investigators. Just a half-century ago, long before bacteria or bacilli were ever thought of in this connection, a wide-awake German professor, Dr. Kleucke, of Leipsic, proved this fact by his observations on 16 previously healthy children who were fed on milk from four cows in the same dairy, all of which were affected with a "scrofulous-tuberculous" disease, as revealed by post-mortem examinations. The children all developed marked symptoms of scrofula very soon after beginning the use of this milk, and most of them showed signs of improvement upon a change to healthy milk and recovered. While some hold that the milk is never infected unless there be local tubercular disease of the udder, there seems to be little doubt that it also occurs in cases of general tuberculosis, when there is no apparent involvement of the udder. But however that may be, there is no doubt about the fact that tuberculosis is communicated to man through the milk of diseased cows, and, remembering the terrible nature of the malady, that should be sufficient to put us on our guard.

As *cholera* is an exotic disease, fortunately rare in our country, it is only necessary to say that its method of transmission through milk is practically identical with that of typhoid fever.

In the transmission of these particular diseases that I have mentioned the milk acts merely as the vehicle for carrying the germs to the body. Having once obtained an entrance they fasten upon the tissue suitable for their development, as, for example, the typhoid fever germ on certain little glands in the small intestine, the tubercle bacillus on various tissues, though most commonly upon the lungs, and the diphtheria and scarlet fever germs upon the throat. They then reproduce themselves with great rapidity, elaborating in the process of growth each its particular toxine or poison, which is absorbed into the circulation and causes the symptoms characteristic of the disease. But there are other bacteria of many varieties, belonging to the general class which causes putrefaction in organic matter and which are found everywhere, that infect milk and elaborate therein certain virulent poisons.

Let me illustrate the manner in which this poison is developed by a familiar example. Everybody knows that if you leaven bread and keep it in a warm place it will rise, though everybody may not know why it rises. It is accomplished in this way: Yeast is a microscopic plant, and may be called a first cousin of the bacteria, which are also microscopic plants, oval in shape and about $\frac{1}{1000}$ of an inch in diameter. It propagates by budding. A little daughter-cell comes out from the side of the mother-cell and, when large enough, so to speak, to take care of herself (which she becomes in an incredibly short time) she cuts loose from her parent and immediately proceeds to sprout daughters of her own. In this process of growth the saccharine substance upon which it feeds is separated into two different chemical elements—carbonic acid gas, or carbon dioxide as they call it nowadays, and alcohol. You "infect" your dough with the yeast germs, keep it warm so that they may develop the gas which in its effort to escape lightens the mass, and when it reaches the proper point put it in the oven. The heat of cooking kills the yeast germs, and there is no further development of gas—the bread has been "sterilized," as we scientific men say. Just so it is with the bacteria we are now considering. They get into milk, which is the right kind of soil for them, as dough is for the yeast plant, that is allowed to remain warm enough for their growth, and by their development separate certain substances in the milk upon which they feed into other chemical elements that we know to be poisonous to man. One of these milk poisons has been discovered. In 1883–4 about 300 people were taken violently sick in Michigan from eating cheese, with vomiting, purging and great prostration—symptoms very much like those of cholera morbus—and the Board of Health of that State requested Dr. Victor C. Vaughan, the brilliant Professor of Hygiene and Physiological Chemistry in the University at Ann Arbor to investigate the matter. He did so, and found the cause to be a poison of bacteriological origin, though he did not succeed in settling upon the particular bacterium. He afterwards found the same poison in milk. Finding it first in cheese, he named it "tyrotoxicon" (cheese-poison.) Dr. Vaughan thinks this tyrotoxicon is the cause of cholera infantum and that other similar though less energetic poisons derived from other varieties of bacteria produce entero-colitis, the summer diarrhœa of infants. We know that these diseases only occur in summer, and that bacteria will not grow in a temperature under 60 degrees. It is these two diseases which cause such fearful mortality among children, particularly in our large cities, owing to the transportation of the milk long distances through the heat, thereby affording favorable conditions for the development of these toxicogenic or poison-producing bacteria.

To give you some idea of this infant mortality I will impose a few more statistics upon you. According to the general mortuary reports, about 40 per cent. of all deaths occur under 5 years of age. That these deaths may reasonably be referred to milk as the cause, in a large proportion of the cases, is more than probable. The following analysis of the mortuary report of Chicago for the month of August, which does not materially differ from those of other large cities, supports this view. In a population of 1,750,000 the total deaths were 2,261. Of this number 1,087, or 48 per cent., were under 5 years of age, 757 under 1 year, and 330 between 1 and 5, while between 5 and 10, after they had passed the milk stage, there were only 65 deaths. Fifty-four per cent. of the deaths under 1 year were due to diarrhœal diseases, 50 per cent. between 1 and 5, and only 3 per cent. between 5 and 10.

We now come to the practical part of our subject. How can we prevent these disease-producing germs from getting into our milk? Or, failing in that, how can we destroy them without seriously injuring the milk as a food?

In regard to the specific germs which cause consumption, typhoid fever, diphtheria and scarlet fever, it can only be done by thorough inspection and control of all dairies supplying milk to the public by municipal or other health authorities empowered by law to enforce the necessary rules. These rules may be briefly summarized under: Healthy cows, supplied with good food and pure water; perfect cleanliness of the hands of the milkers, of the udders of the cows, and of all milk utensils, and rigid abstention from contact with the milk at any point of all persons who have been exposed to infectious diseases. I regret to say that I am afraid that public sentiment in North Carolina is not yet sufficiently educated for this, but I hope that this progressive city will set the example.

When it comes to keeping the toxicogenic or poison-producing bacteria—those which cause cholera infantum and the summer diarrhœa of infants, with their dreadful mortality—out of the milk, it is practically impossible, for the reason that they are floating round everywhere. But if we cannot keep them out we can keep them in abeyance and prevent their forming the poisons which cause the diseases, and much more easily than we can secure obedience to the rules suggested for protection against the specific bacteria. You remember that these bacteria do not flourish in a temperature under 60 degrees, and that if they do not grow they will not produce the poison—that it is not the bacteria themselves but their toxines or poisons which are to be dreaded, and that these are formed in the milk and not in the tissues of the body, as are the toxines of the specific germs. This being true, you will see at once that the whole thing is summed up in the one word, *coolness.* If milk is immediately cooled down to 60 degrees or lower, and kept there until used, there would be little necessity for apprehension of the poisoning of hand-fed babies. But unfortunately in this warm climate of ours, with the lack of ice and cold springs, this is not easily done, even by most individuals keeping their own cow, and, of course, it is still less feasible for dairies delivering milk to the public. So that it is always safest, in summer, to assume that the milk intended for infants, unless we are positively certain that its temperature has not at any time gone above 60, is infected, and to act accordingly. The question now is: How can we destroy the bacteria and prevent the formation of the poisons with the least possible injury to the food qualities of the milk?

This can be done by heat. Boiling the milk will effectually kill the bacteria, but a better plan is to sterilize it by steam in one of the sterilizers which can be gotten for you by any druggist for a small sum. Both of these methods, however, change the taste of the milk and somewhat impair its nutritive qualities, but as Dr. Vaughan forcibly says, "The risk in using unsterilized milk is too great, and the question with the parent or physician is not, 'Am I giving the child the best food,' but 'Am I giving it a poison?' The choice is easily made when the matter is looked at in this light." But the best method of rendering the milk safe is by what is known as Pasteurization, which is the application of just enough heat to kill the bacteria without altering the taste or the nutritive qualities of the milk to any very appreciable extent. It has been ascertained that exposure to a temperature of about 155 degrees for a half hour will practically sterilize milk. As soon as the Pasteurizing is finished the milk should be rapidly cooled and put in a refrigerator, or, in the absence of ice, kept in the coldest water available until used. I show you an excellent contrivance for the low temperature Pasteurization of milk, designed by Dr. Freeman, the pathologist to the Foundling Hospital and to St. Mary's Hospital for Children in New York, which can be easily operated, and can be bought for about $3.

If you cannot get a Pasteurizer for any reason, you might sterilize the milk by this method after a crude fashion, which would certainly be better than nothing, in this way: Take a clean bottle that has been scalded, fill it with the milk, stop it loosely with raw cotton (germs cannot pass through cotton, as Tyndall proved), set it in a narrow high tin bucket, and fill this bucket up to the neck of the bottle with ordinary cool water, set this bucket with the top off in a larger tin bucket that has two inches of boiling water at its bottom, put the top of the big bucket on at once and set it aside on a table out of a draught and let it stand for three-quarters of an hour. Then remove and set the small bucket in a tub of cold water, and change the water in the tub every fifteen minutes for three times, after which take the bottle out and put it away in the coolest place you have, taking care not to remove the cotton plug until the milk is needed for use. But it is much the best plan to get a Pasteurizer if you can.

Notwithstanding the necessarily hurried and incomplete treatment of the subject, I trust that I have shown to your satisfaction that four of our most dreaded diseases—tuberculosis, typhoid fever, scarlet fever and diphtheria—are sometimes transmitted to man through the instrumentality of milk; that milk often becomes poisonous for the want of the proper care in warm weather, and that this poisonous milk is the agency most responsible for "the slaughter of the innocents" which we witness every summer; and, finally, that it is of the greatest importance that you should spare no pains to guarantee the purity and safety of the milk furnished your families, more especially your little ones.

In conclusion, I desire to acknowledge my great indebtedness in the preparation of this paper to the very complete and admirable report on "Morbific and Infectious Milk" by Drs. Busey and Kober, published in the last report of the health officer of the District of Columbia; and to the most excellent article on "Diarrhœal Diseases" by Dr. Vaughan in the "American Text-Book of the Diseases of Children."

4

COLUMBIA UNIVERSITY LIBRARIES

This book is due on the date indicated below, or at the expiration of a definite period after the date of borrowing, as provided by the rules of the Library or by special arrangement with the Librarian in charge.

DATE BORROWED	DATE DUE	DATE BORROWED	DATE DUE
C28(1141)M100			